
**SUPPLEMENT REPORT TO OCTOBER 1981
RESTUDY REPORT
AND
GENERAL DESIGN MEMORANDUM (REVISED)**

**SHORE RESTORATION
AND PROTECTION**

Cliff Walk

Newport, Rhode Island

OCTOBER 1988



**US Army Corps
of Engineers
New England Division**



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

November 28, 1988

Engineering - Project Management

Mr. Herbert S. Cables, Jr.
Regional Director
National Park Service
15 State Street
Boston, Massachusetts 02109

Dear Mr. Cables:

Enclosed are 10 copies of the 1988 Supplement Report to the October 1981 Restudy Report and General Design Memorandum entitled "Shore Restoration and Protection, Cliff Walk, Newport, RI". This fulfills the services required by and set forth in Appendix A to the Interagency Agreement between the National Park Service and the Corps of Engineers (IA-1600-8-8002), signed August 11, 1988.

The New England Division retains an extensive body of information regarding Cliff Walk in its files dating from the Division's first involvement in 1965. Should the Park Service become involved in restoration work at the Walk, these files could be of interest and are available.

My staff has enjoyed working with Mr. Charles Tracy of your office on this project. If you require additional information, please contact me at 647-8500, or Mr. Robert Harrington, at 647-8722.

Sincerely,

Richard D. Reardon
Chief, Engineering Division

Enclosures

SUPPLEMENT REPORT
TO OCTOBER 1981
RE-STUDY REPORT AND GENERAL
DESIGN MEMORANDUM (REVISED)
ON SHORE RESTORATION AND PROTECTION
CLIFF WALK - NEWPORT, RHODE ISLAND

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INTRODUCTION

This supplement to the Cliff Walk Re-study Report of 1981, and the previously approved General Design Memorandum of November 1969, has been developed to provide an update of the current condition of the entire walk and surrounding area. An Interagency Agreement (IA) between the Army Corps of Engineers, New England Division (NED) and the National Park Service (NPS), tasked NED with the updating of the 1981 study. This update includes current condition description and an estimate of quantities and construction costs for required repairs to Cliff Walk.

Based upon the Scope of Work (Appendix A of the IA), NED personnel have conducted a site reconnaissance visit, evaluated the current condition of Cliff Walk and recommended remedial measures which have been reflected on copies of Plates 5 thru 30. Also included are photographs, the locations of which are identified on the plates.

SUMMARY

Based upon the scope of work in the IA, personnel from the New England Division conducted a site reconnaissance level survey of Cliff Walk. This was done on September 13 through 15, 1988. Basic field measuring techniques i.e. measuring wheel and taping, were used to determine the location and extent of the conditions noted. The level of detail involved in this reconnaissance is not intended to be considered either a detailed survey or to eliminate the need for additional more definitive information gathering surveys. The information presented in this update is not intended to be conclusive, but rather to provide guidance with which future decisions can be made regarding the work required at Cliff Walk.

The results of the reconnaissance survey, including proposed remedial work, are described in the Project Plan. The limits of the reaches described, the locations of the various areas of work, and typical sections and details, are noted on the plates contained in Appendix A, Plates. These plates are taken directly from the 1981 report and were modified to reflect the conditions noted during the reconnaissance survey. Additional sections shown supersede 1981 sections. Property owners shown on plates are as of 1981 and may not reflect present owners. Photographs of the areas noted are contained in Appendix B, Photographs.

During the site reconnaissance, several areas were noted as presenting potential hazardous conditions to property and the public. These areas are highlighted in the section titled Critical Areas and are in need of immediate remedial action to reduce or eliminate the potential hazards.

Appendix C is a summary of the quantity and construction cost estimates for the items of work described in the Project Plan. The costs are grouped to reflect all of the work within a given reach except for minor items of work such as fence repair, clearing of vegetation, site preparation and miscellaneous drainage repairs. For these minor items a separate cost estimate is provided which reflects the total effort for these items throughout the length of Cliff Walk. Also included is a cost comparison chart which reflects 1981 costs compared to 1988 costs. The chart reflects the 1988 costs for work which was indicated in the 1981 report and not undertaken and for the additional new work identified during the recent survey.

PROJECT PLAN

PROJECT PLAN

a. Shore Protection and Restoration - The proposed work is divided into seven reaches that are identified on the plates in Appendix A. The following are descriptions of the work areas and the remedial measures needed for restoration. Cost estimates of the remedial work for each reach are presented in Appendix C. Numbers following the location of each reach indicates the plates where the reach is shown.

Reach 1 - Memorial Boulevard to Sundlun property. (Plates 8, 9 and 10)

Plate 8 - At the base of existing concrete wall, undermining has occurred. This will require 9 cy of concrete fill (see Section K-K). On the walk and at the end of the same wall, a concrete block wall, partially destroyed, should be replaced with a fence and a swale.

Plate 9 - This area requires bituminous walk repairs, swales and a small concrete stabilizing wall with chain link fencing (Section Z-Z). Also, as shown in Section Y-Y, construct a toe to the existing stone slope protection for a length of 90 feet.

Plate 10 - There are various eroded areas in need of repair. The bituminous walk is in need of repair at various locations and additional drainage swales are needed. A 10 foot section of concrete retaining wall, below the walk, is missing but this has had no apparent effect on the walk (no work is required but periodic inspections should be conducted to monitor the site).

Reach 2 - Vicinity of Firestone property. (Plates 11, 12 and 13)

Plate 11 - As indicated in the 1981 study there is an area about 800 feet north of Narragansett Avenue where the walk is threatened by erosion. This erosion which originally affected a 50 foot length of walk has increased to approximately 200 feet. The walk is severely threatened and requires protection. Stone slope protection is recommended. The length of the protection, at the toe would be about 270 feet. In addition there are minor areas of the walk surface that also require repair.

Plate 12 - At a point 80 feet south of Narragansett Avenue, a small area of walk is threatened by erosion and construction of a new concrete wall (10 feet high x 20 feet long) and drainage provisions are recommended. At "Forty Steps" there are areas of work that have been accomplished by others.

Plate 13 - No work, is required along the portion of Cliff Walk shown on this plate.

Reach 3 - Vicinity of O'Donnell property to Ochre Point. (Plates 14, 15 and 16)

Plate 14 - The possibility of a slope failure exists at an area adjacent to the O'Donnell property. An undercut below the cliff and severe cracks in the rock parallel to the rock cliff above threaten a 50 foot section of the walk. Continuation of stone slope protection (40 feet) along with a concrete wall (30 feet) and fence are recommended for this area.

Plate 15 - Stone slope protection, beginning approximately 60 feet south of Shepard Avenue and running a total length of 320 feet, is proposed due to extensive undermining of walls in this area, (Section G-G). Other areas of the existing wall require pointing and patching. Also recommended is approximately 500 feet of bituminous concrete (Type "B") walk in place of the existing gravel walk.

Plate 16 - Continuation of the 500 foot long bituminous walk is recommended. Some patching of concrete walls and walk is also necessary. Provide crushed stone walk (Type C).

Reach 4 - Ochre Point to Sheep Point. (Plates 17 thru 22)

Plate 17 - Provide a 1300 foot long continuous crushed stone walk (Type "C") with drainage. Repair concrete wall at various locations.

Plate 18 - End Type "C" walk. Existing wall in this area is in good condition.

Plate 19 - Repair and patch existing walls. Walk is in good condition except for excessive vegetation which should be trimmed back.

Plate 20 - Requires minor repairs to wall and stone protection. Upgrading of walk required at various locations. Replace minor areas of displaced stones along toe of rock berm.

Plate 21 - At 'Pagoda' area extend existing concrete wall 15 feet and underpin foundation wall at various locations. The 'Pagoda' tunnel wall is in need of repair and lighting. Repair steps at southern end of tunnel.

Plate 22 - Minor repairs needed on existing concrete wall.

Reach 5 - Sheep Point to Rough Point. (Plate 23 and 24)

Plate 23 - Entire stone wall in this area needs pointing and patching along with the reconstruction of a 50 foot section. A gravel walk (Type "D") is proposed along with backfilling and stabilizing the adjacent slope. Where there are no existing walls it is proposed to construct stone slope protection approximately 730 feet long with a crushed stone walk (Type "C") along the top.

Plate 24 - Continue the proposed stone slope protection with Type "C" walk for the majority of this reach. Begin a concrete walk at the point where it is proposed to end the slope protection. This walk would run a length of about 400 feet and be anchored to bedrock with rock anchors.

Reach 6 - Rough Point to Ledge Road. (Plate 25, 26 and 27)

Plate 25 - End concrete walk. The remaining walkway (400 feet) will be crushed stone (Type "C"). A small area of stone slope protection is proposed approximately 130 feet south of the existing wooden bridge. The existing stone wall and abutment need to be repaired and drains are required at proper locations.

Plate 26 - A small section of stone slope protection (160 feet) is proposed for this area. The walks should be of gravel and crushed stone. Point and patch existing stone wall.

Plate 27 - This area is in good condition and needs very little work. Marking the limits of the walk is suggested.

Reach 7 - Ledge Road to Bailey Beach. (28, 29 and 30)

Plate 28 - The general condition of walk in this section is fairly good except for a few areas that need minor repairs. The walkway is not continuous in this reach but is interrupted by breaches of bedrock. At two locations, it is proposed to construct stone slope protection, about 300 feet in length. A Type "C" walk is recommended along the top of the stone slope protection connecting the existing wall sections. Marking the undefined sections of the walk is suggested.

Plate 29 - End Type "C" walk and stone slope protection.

Plate 30 - No work is required along the portion of Cliff Walk shown on this plate.

Miscellaneous - Additional items of work proposed for the entire walk, and not identified above, are: trimming vegetation adjacent to the walk, site preparation, drainage improvements and repairs to existing fences.

Total estimated costs for completion of the above work is approximately \$2.6 million. This cost represents the cost to rehabilitate Cliff Walk to a safe and passable condition. Future routine maintenance and Real Estate costs are not included in the estimates.

CRITICAL AREAS

CRITICAL AREAS

a. Conditions at several areas of Cliff Walk are considered hazardous and in need of immediate attention to prevent further deterioration and to minimize potential injury to walkers. They are classified as Critical Areas and measures for their protection are summarized as follows:

1. Reach 2, Plate 11 - Approximately 270 feet of stone slope protection in vicinity of the Firestone property is needed. This problem is the result of erosion at the top of the cliff and from wave action below. In some areas temporary shoring has been placed to prevent the walk from collapsing. Estimated cost is \$534,000.

2. Reach 2, Plate 12 - Construction of a concrete wall (10 feet high x 20 feet long) is needed approximately 80 feet south of Narragansett Avenue. The walk at this point is extremely narrow and is progressively eroding. Approximately three feet of material is all that is left from the edge of walk to a vertical drop. Estimated cost \$40,000.

3. Reach 3, Plate 14 - Continuation of the existing stone protection (40 feet) and a new concrete wall (30 feet) is needed at the O'Donnell property. The stone protection is needed at the base of the cliff because of a severe undercut. The concrete wall is needed at the top half because of severe cracks in the rock above. This area is extremely narrow and could possibly cave-in. Estimated cost \$191,000.

4. Reach 5, Plate 23 - Reconstruct 50 foot section of wall and walk at American Capital Corp. property. The walk and wall are completely washed out posing a dangerous situation to walkers trying to complete the entire walk. Estimated cost \$29,000.

Total estimated construction cost to repair these "Critical" areas is \$794,000.

APPENDIX A

PLATES

APPENDIX A

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<u>TITLE</u>	<u>PLATE</u>
Project Map	Figure 1
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General Plan No. 3	Plate 7
Plan No. 1 and Sections	Plate 8
Plan No. 2 and Sections	Plate 9
Plan No. 3 and Sections	Plate 10
Plan No. 4 and Sections	Plate 11
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Plan No. 18 and Sections	Plate 25
Plan No. 19 and Sections	Plate 26
Plan No. 20	Plate 27
Plan No. 21 and Sections	Plate 28
Plan No. 22 and Sections	Plate 29
Plan No. 23	Plate 30

the city of
Newport, R. I.

July, 1973

*prepared by the
Engineering Department*

SCALE IN FEET

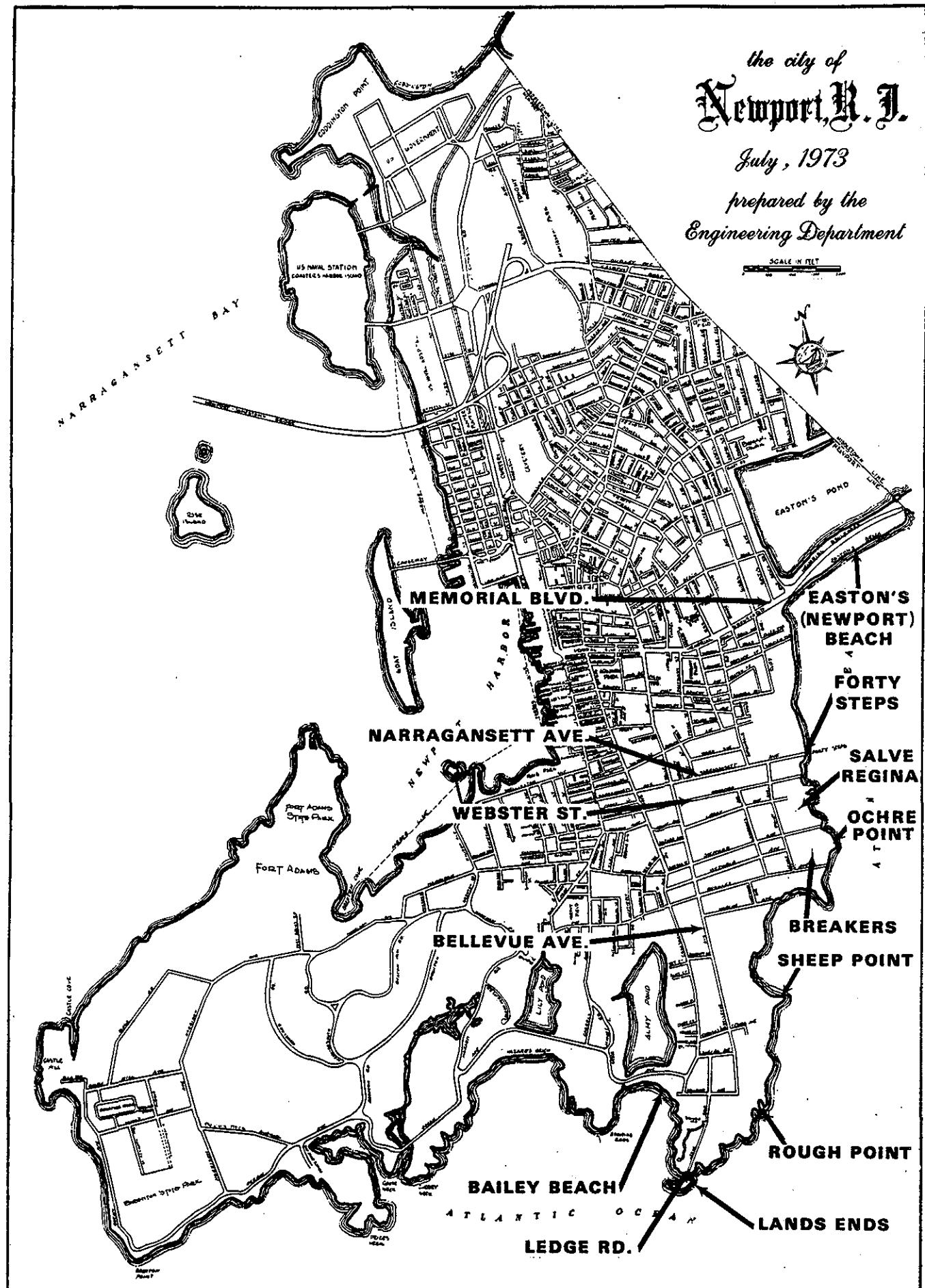
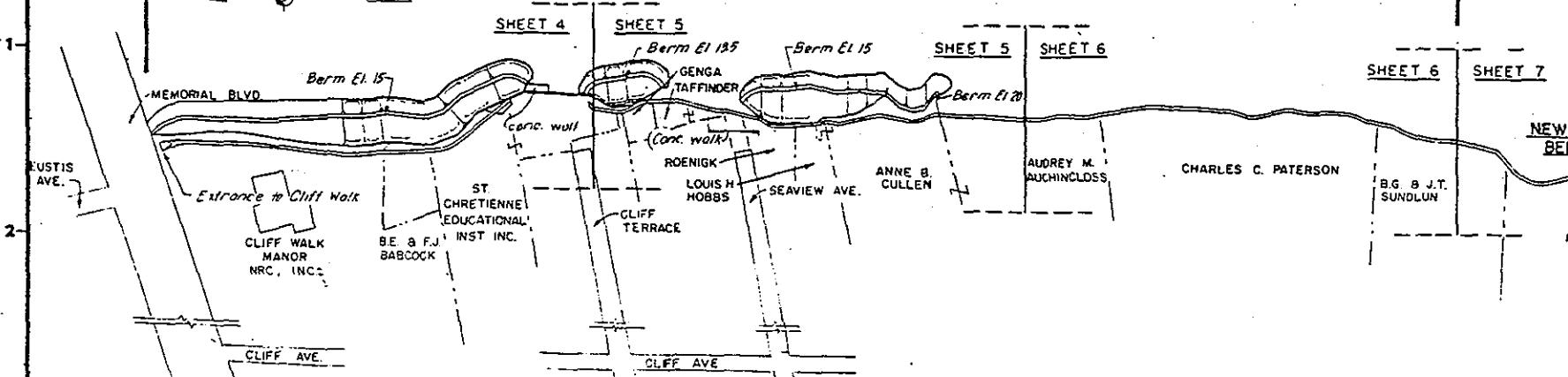


FIGURE 1

REACH 1

REACH 2

RHODE ISLAND SOUND



SHEET 5 SHEET 6

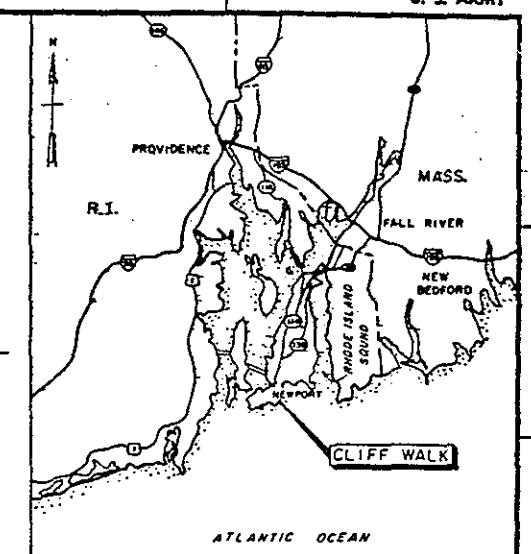
SHEET 6 SHEET 7

SHEET 6 SHEET 7

NEW SHORE PROTECTION
BERM EL. 16.0

FIRESTONE

SHEET 7



LOCATION MAP

SCALE: 1" = 6.7 MI APPROX

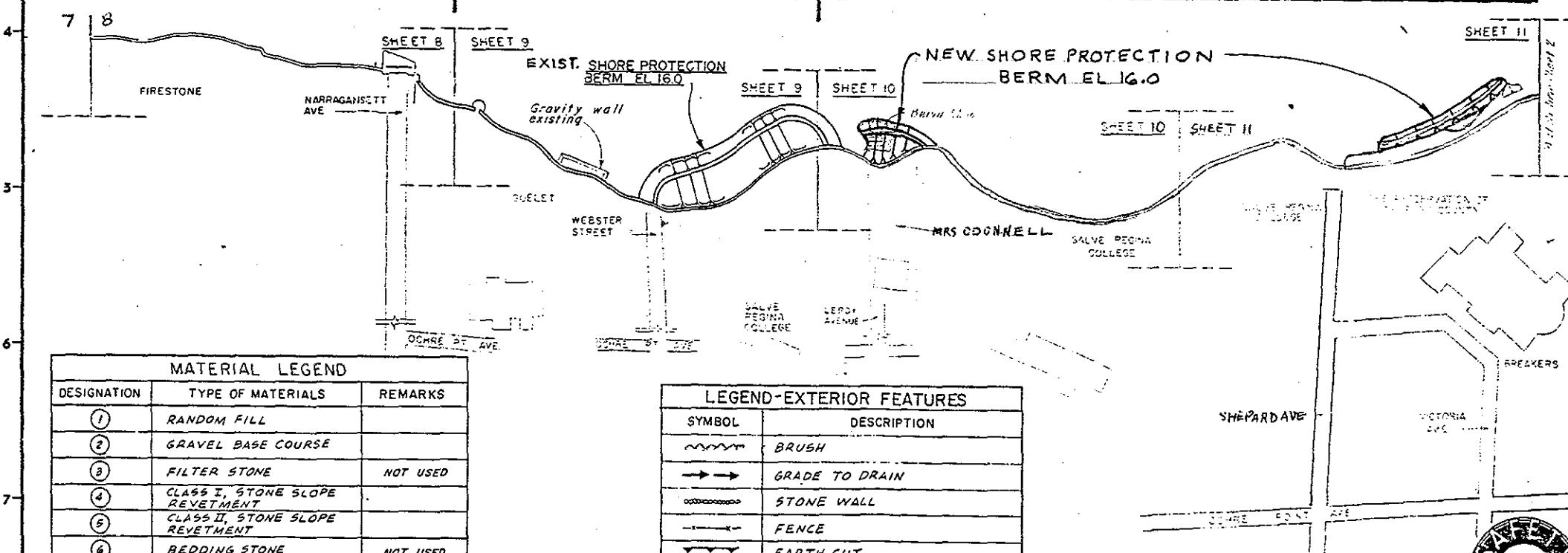
PLAN
SCALE: 1" = 100'

REACH 2

NO WORK

REACH 3

RHODE ISLAND SOUND



MATERIAL LEGEND		
DESIGNATION	TYPE OF MATERIALS	REMARKS
(1)	RANDOM FILL	
(2)	GRAVEL BASE COURSE	
(3)	FILTER STONE	NOT USED
(4)	CLASS I, STONE SLOPE REVETMENT	
(5)	CLASS II, STONE SLOPE REVETMENT	
(6)	BEDDING STONE	NOT USED
(7)	ROCK FILL	
(8)	OMITTED	
(9)	CLASS I, ARMOR STONE	
(10)	CLASS II, ARMOR STONE	NOT USED
(11)	CRUSHED STONE SURFACE	
(12)	GRAVEL BEDDING	
(13)	GRAVEL, FILL	

LEGEND-EXTERIOR FEATURES	
SYMBOL	DESCRIPTION
~~~~~	BRUSH
→→	GRADE TO DRAIN
~~~~~	STONE WALL
— — —	FENCE
	EARTH CUT
	EARTH FILL
	FILL WITH ROCK SLOPE PROTECTION
	EARTH SURFACE (SECTION)
	ASSUMED BEDROCK (SECTION)
	ROCK ON SURFACE (PLAN)
•	CATCH BASIN
—SD—	STORM DRAIN
—ES—	SANITARY SEWER

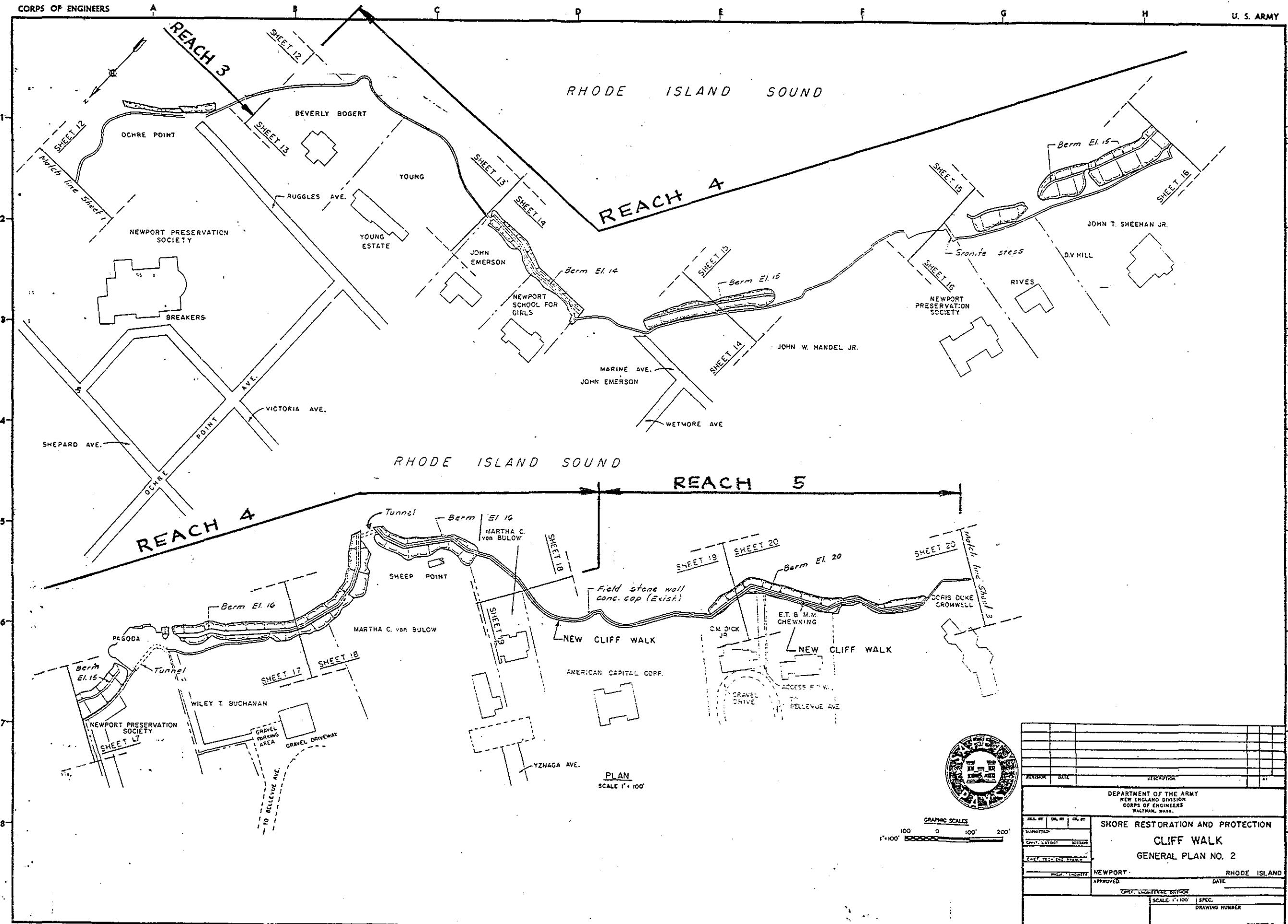
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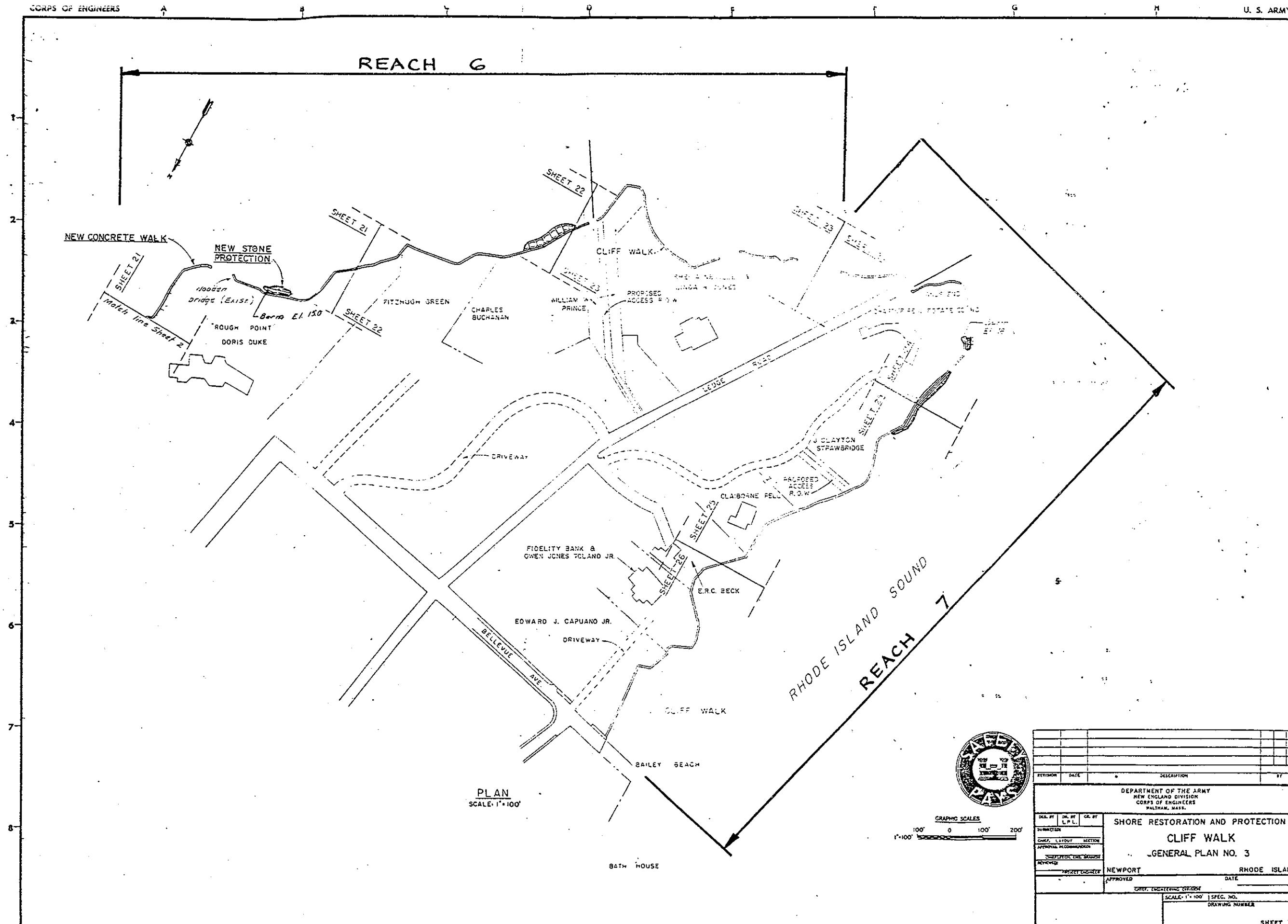
1. "Cliff Walk" from Memorial Blvd. to Bailey Beach will have a 5 foot path cleared free of debris and brush.

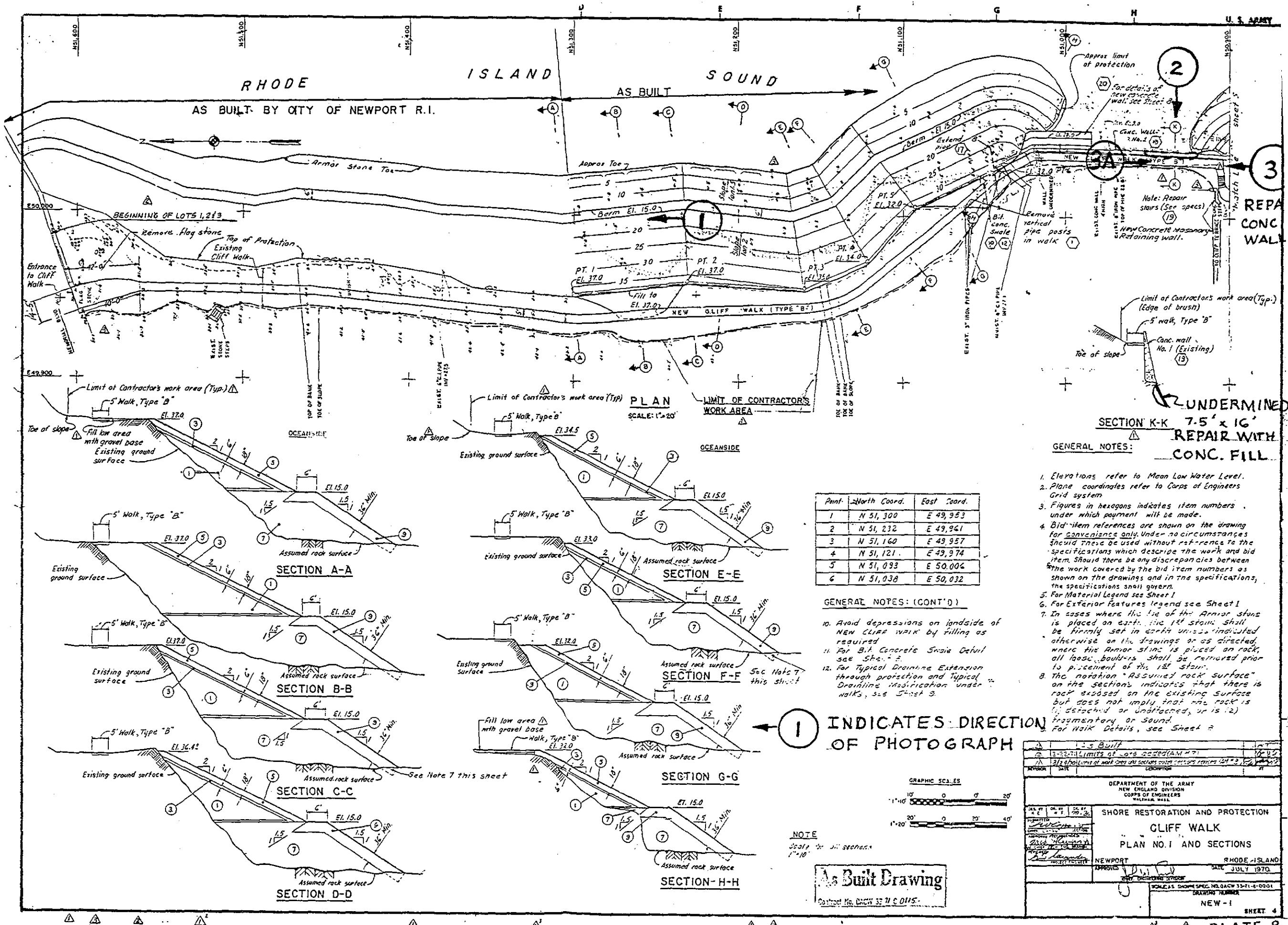
2. For detail of bit. conc. swale and Type "C" and "D" walkways refer to Sheet 8 unless otherwise specified.

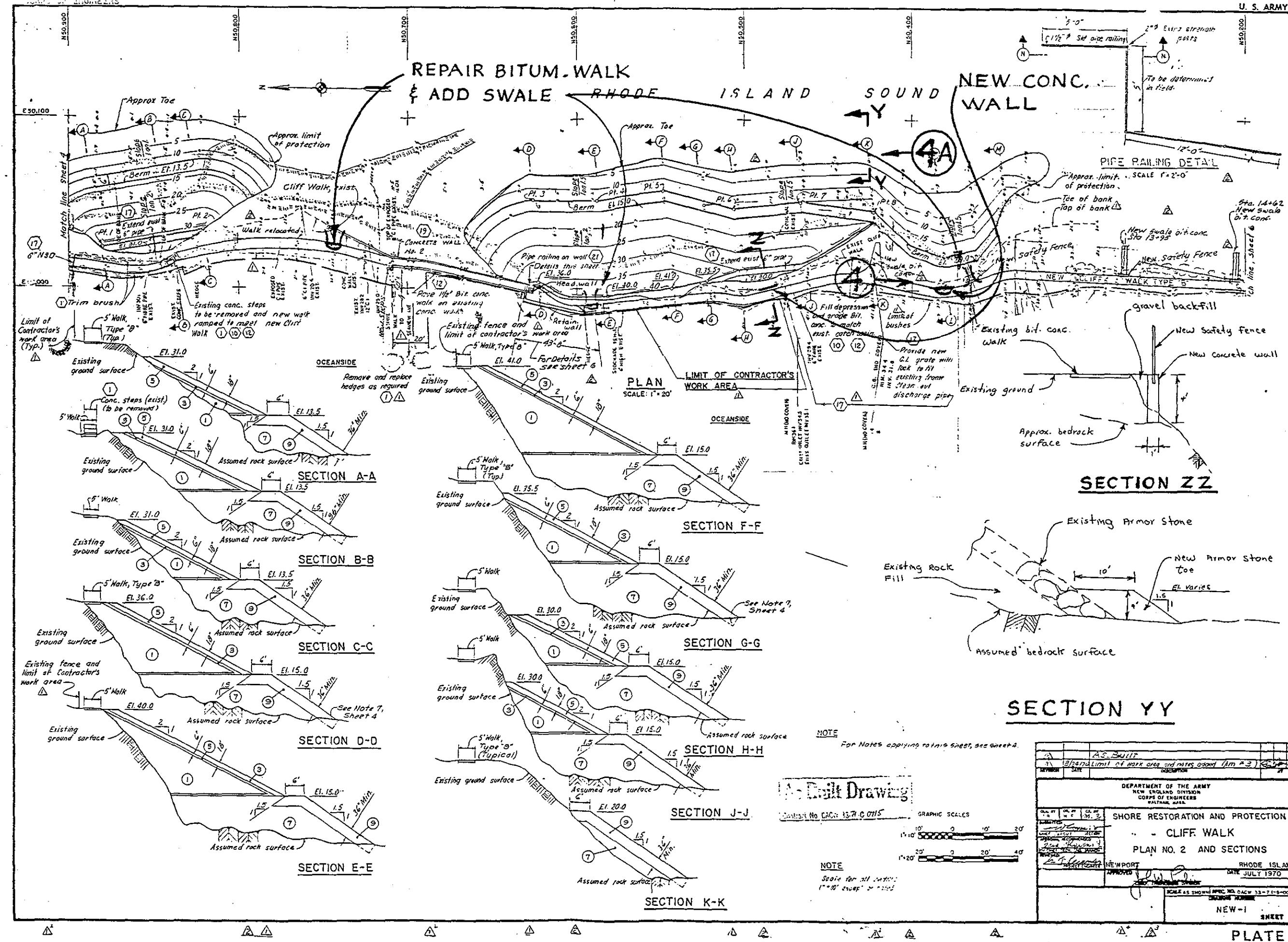
GRAPHIC SCALES
0' 100' 0' 100' 200'

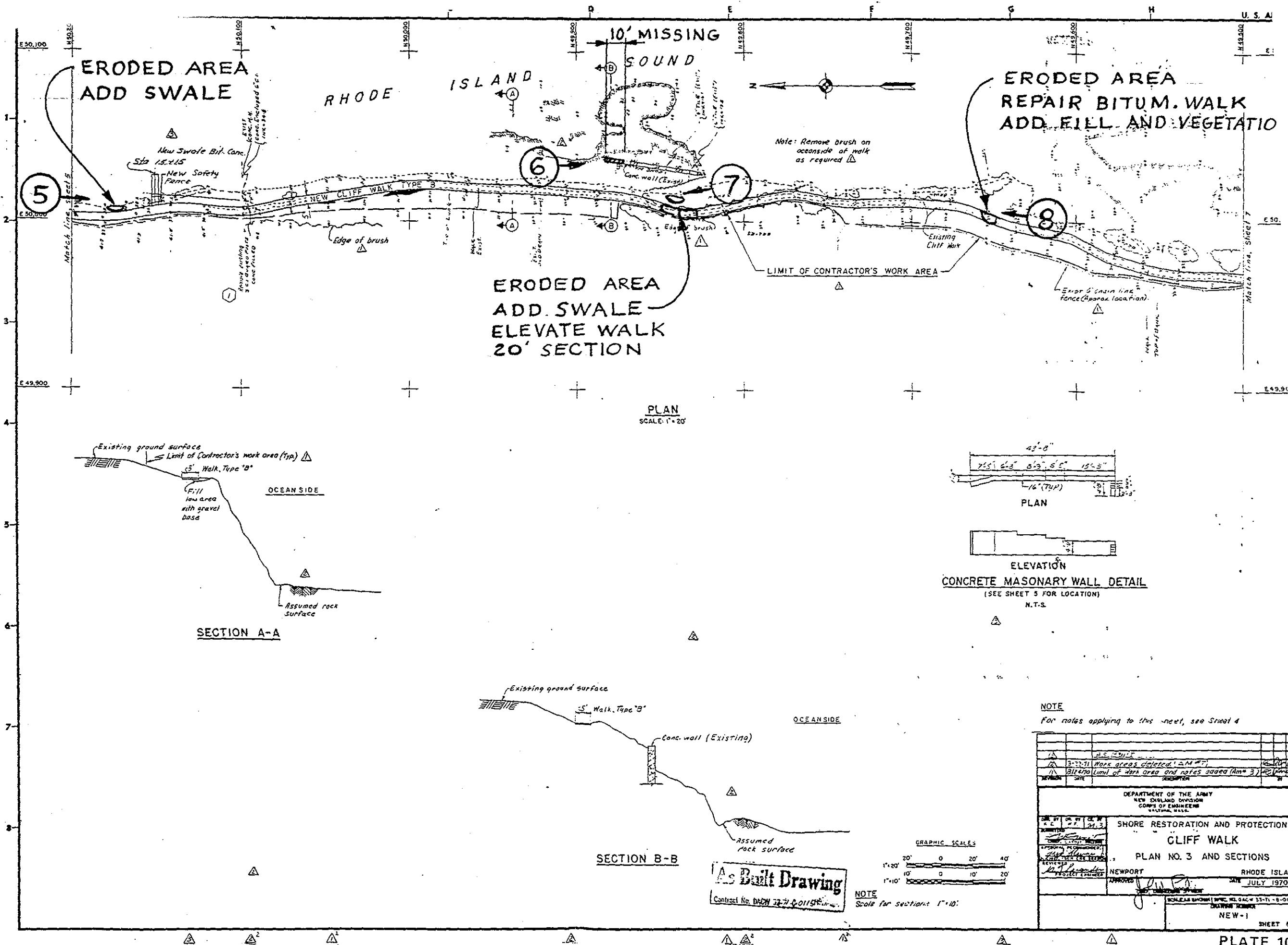
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BY	CHIEF ENGINEER OR DIRECTOR	RELEASER	RELEASER
PROJECT NUMBER	APPROVED	DATE	RELEASER
GENERAL PLAN NO. 1 AND INDEX		SHORE RESTORATION AND PROTECTION	
CLIFF WALK		Rhode Island	
GENERAL PLAN NO. 1 AND INDEX		DATE	
Rhode Island		DRAWING NUMBER	
SHEET 1		SCALE AS SHOWN SPEC	

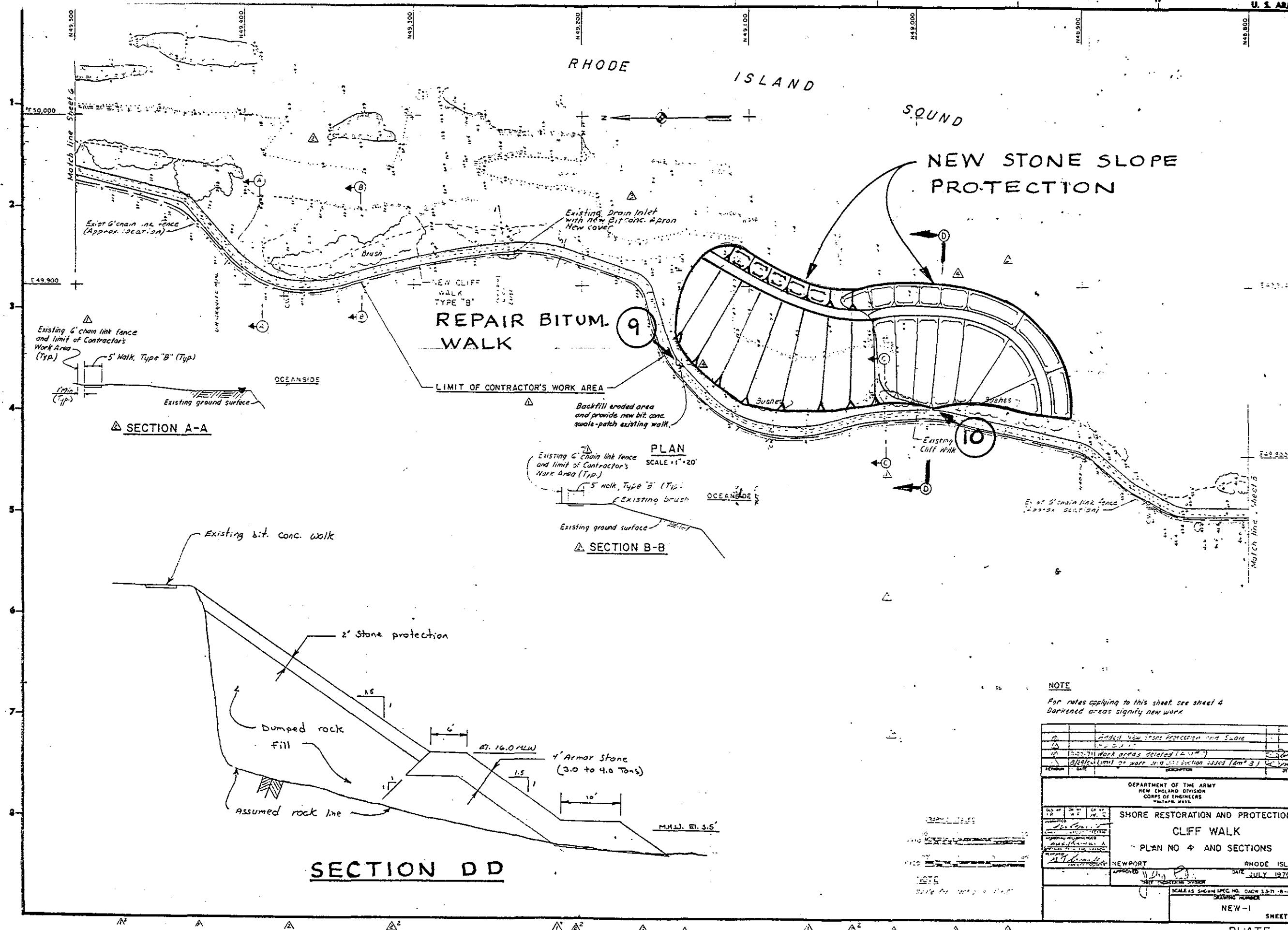


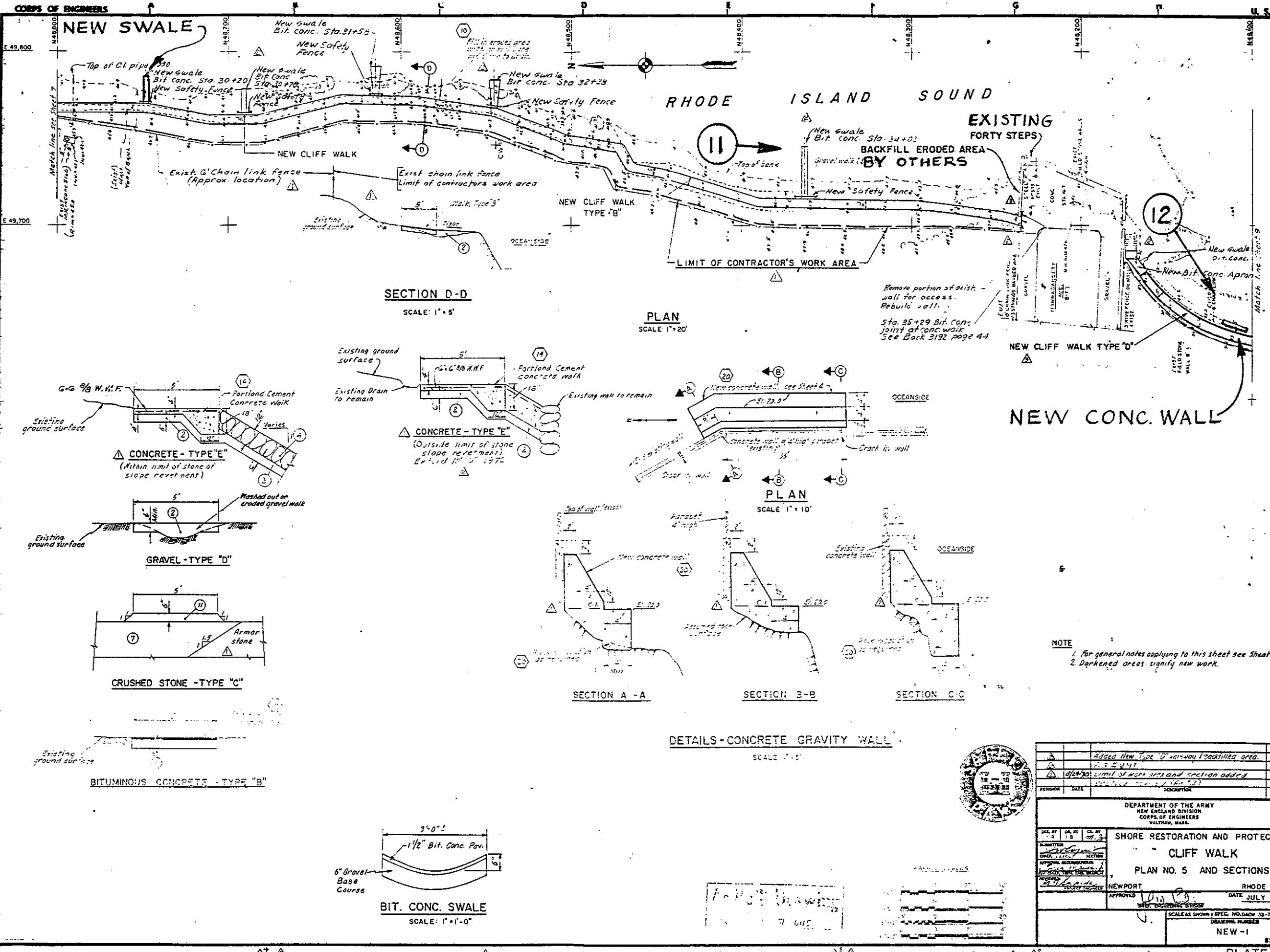


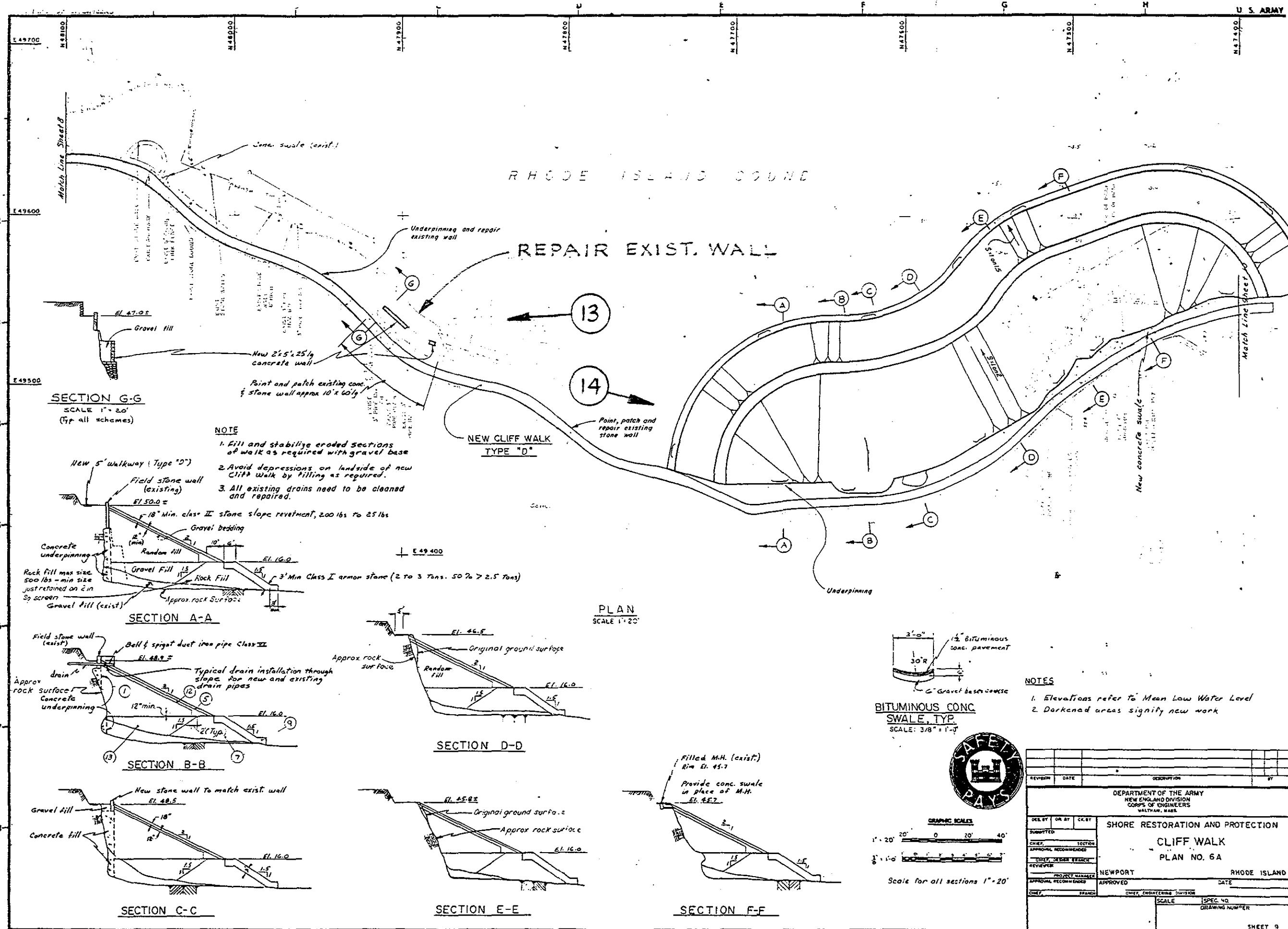


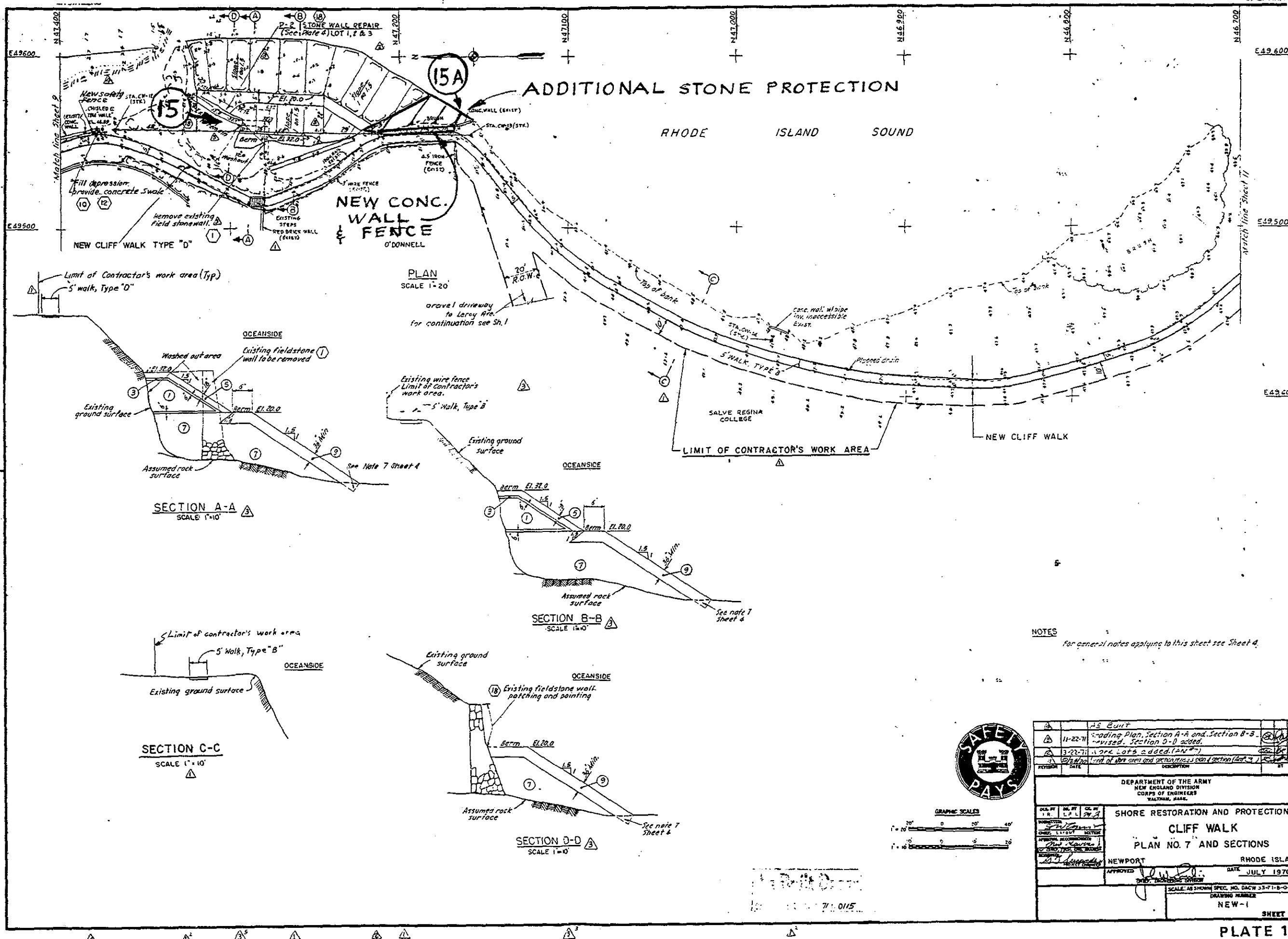


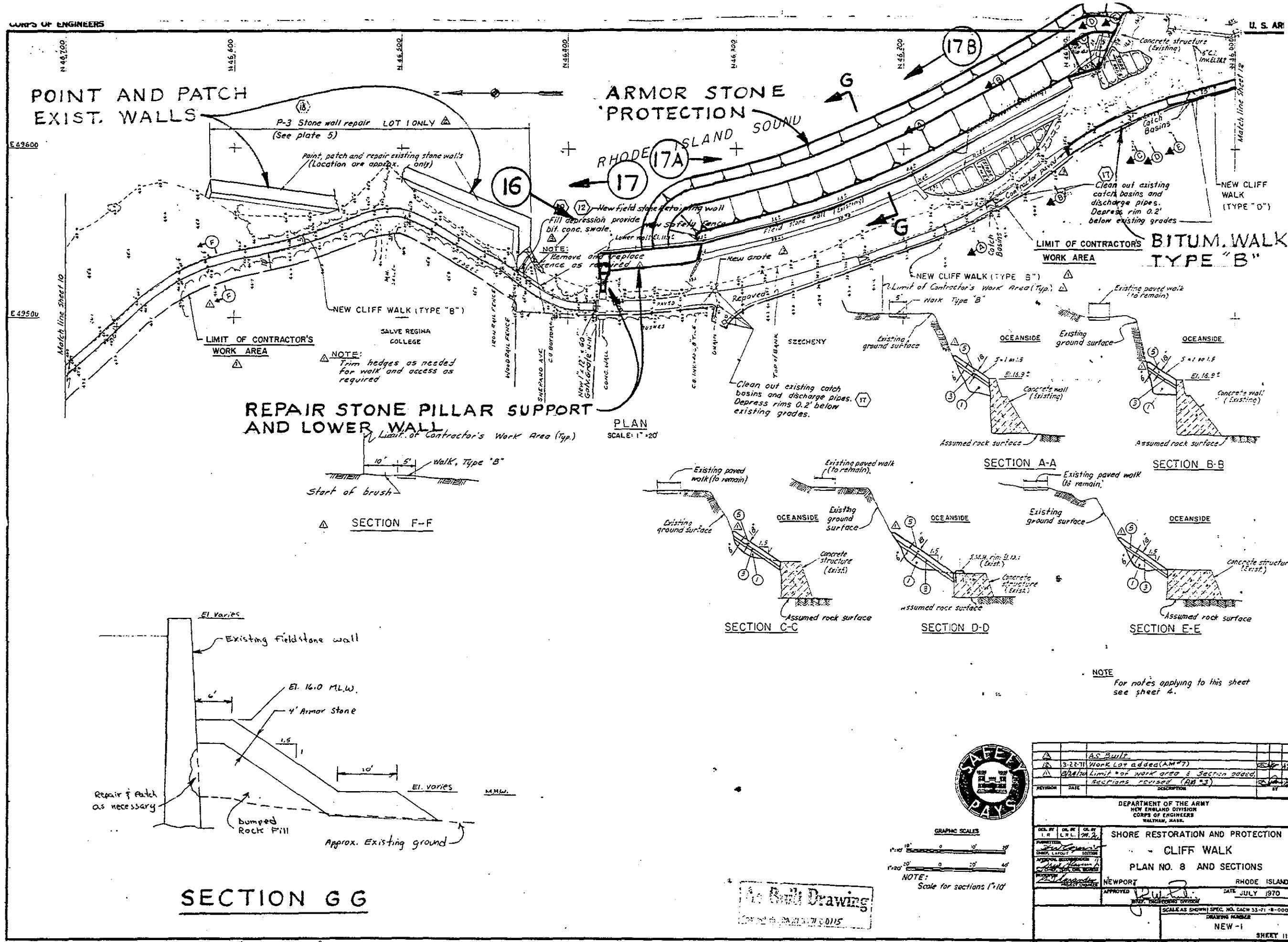


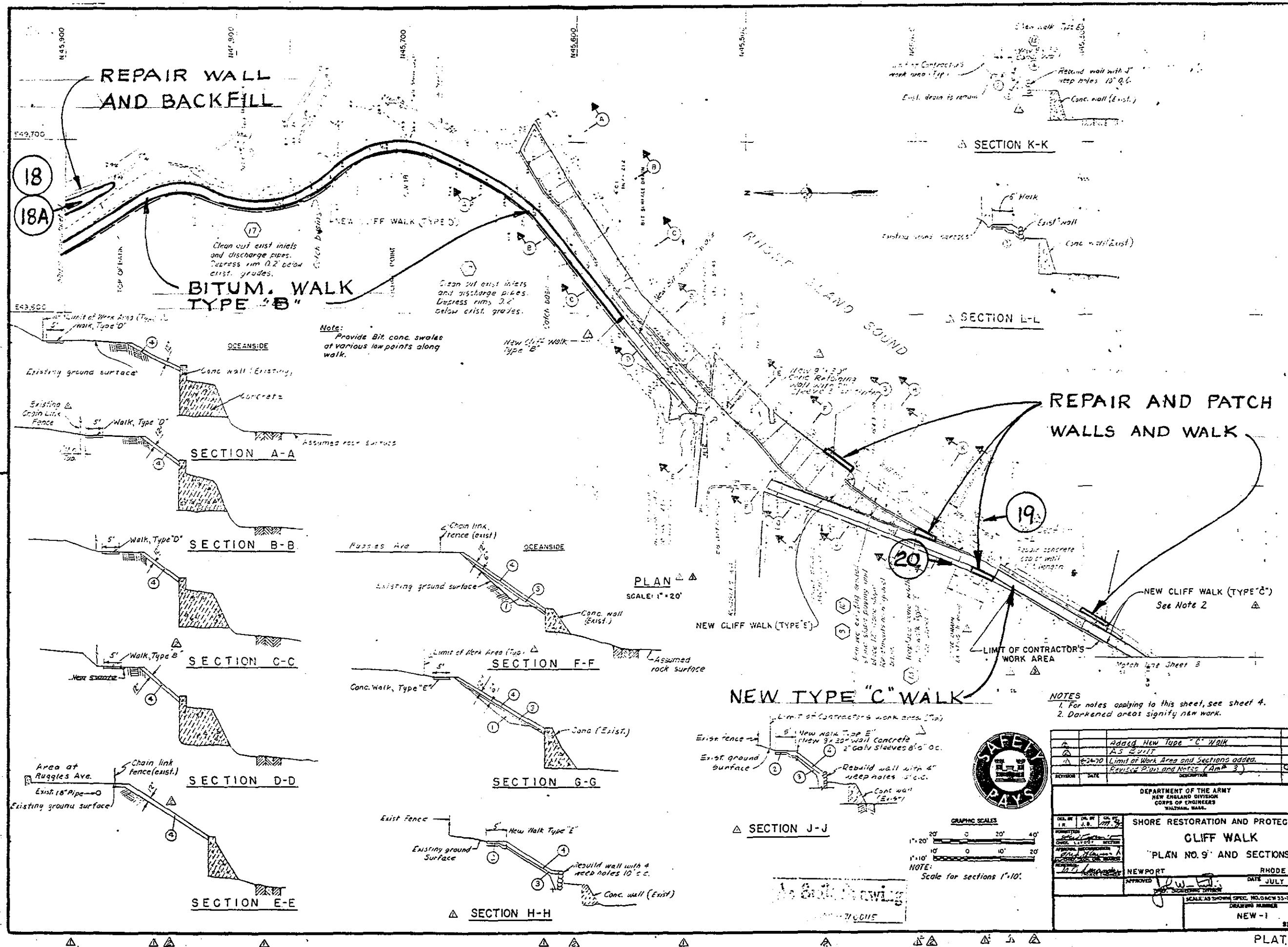


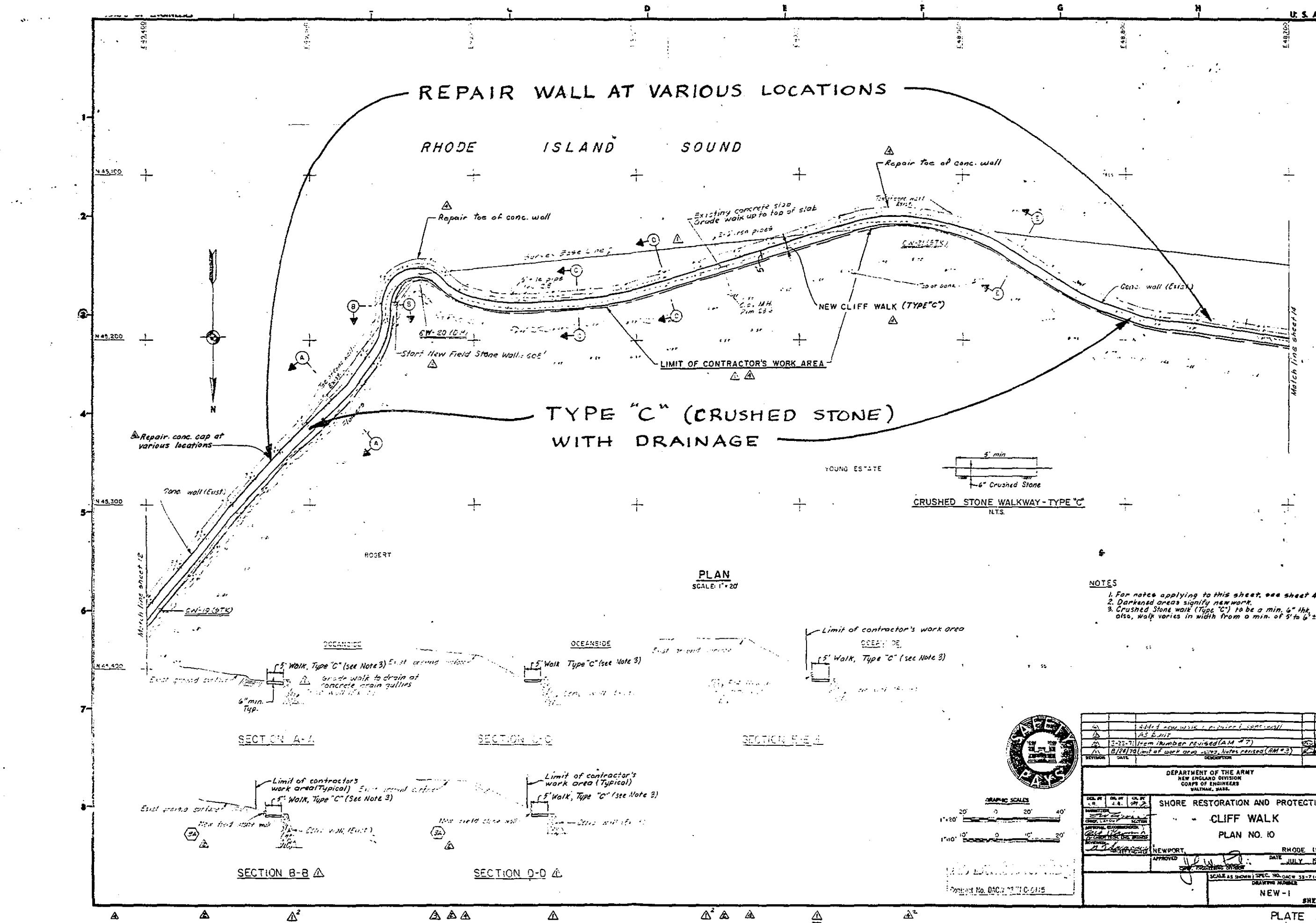


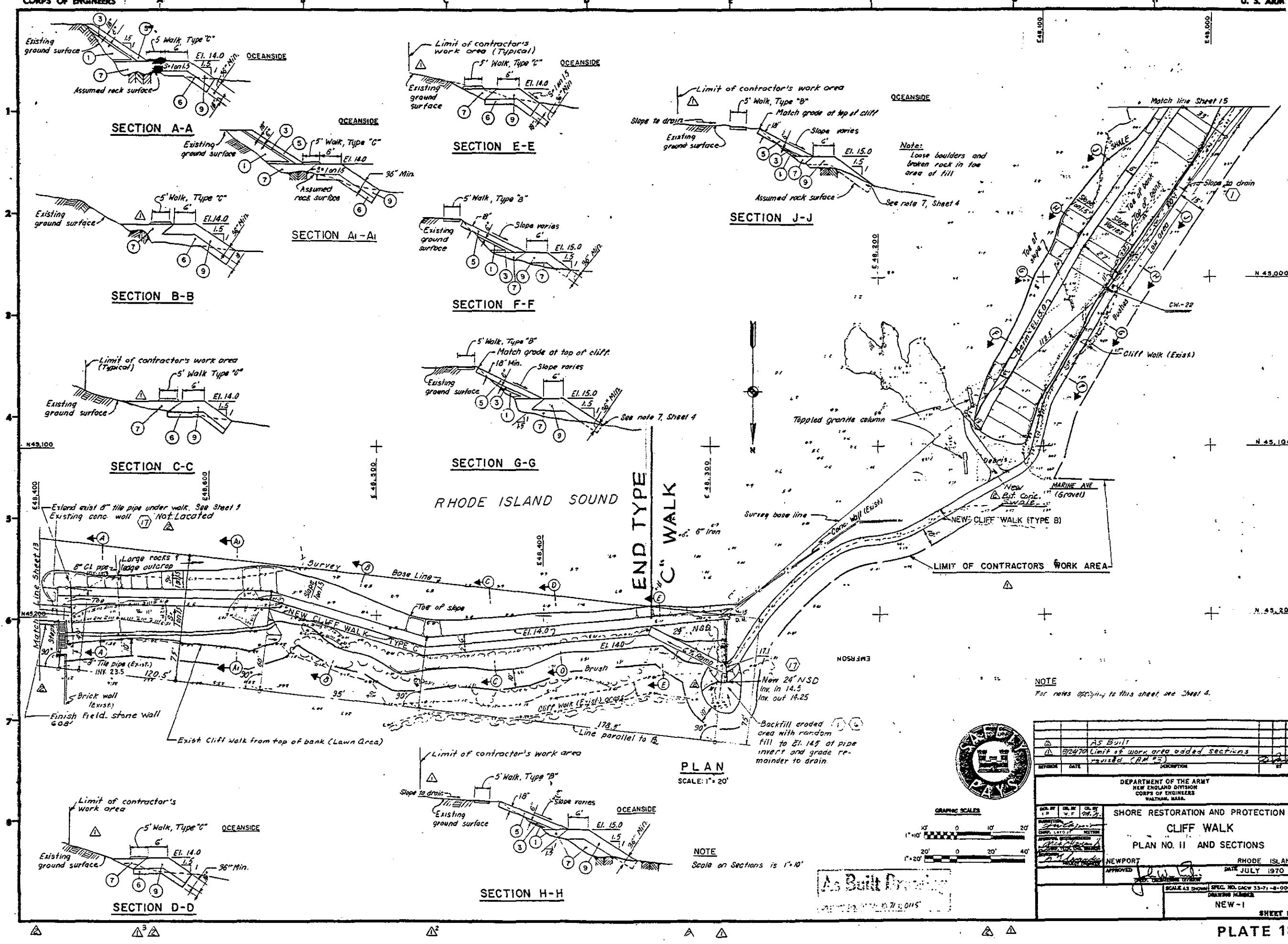


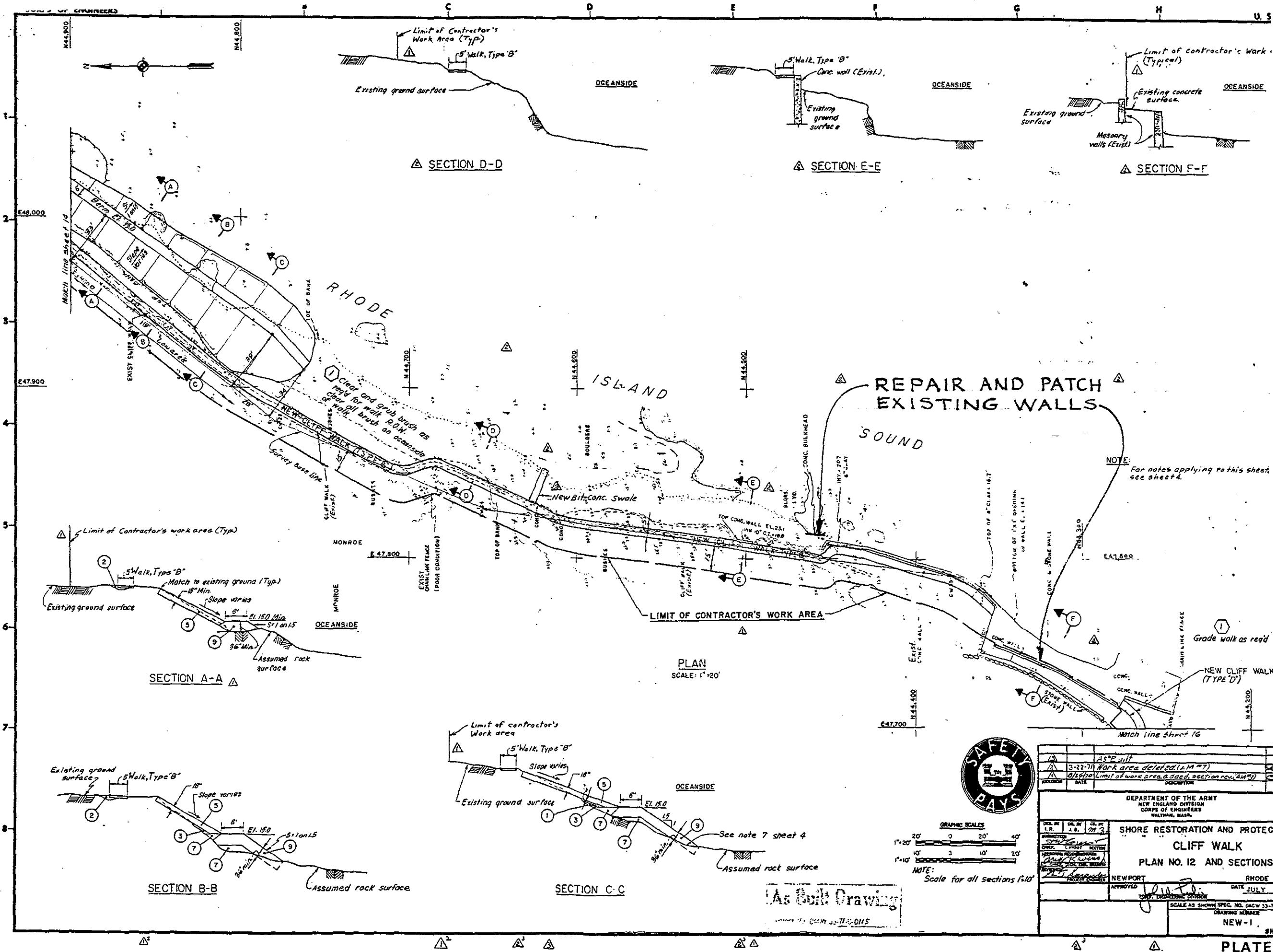


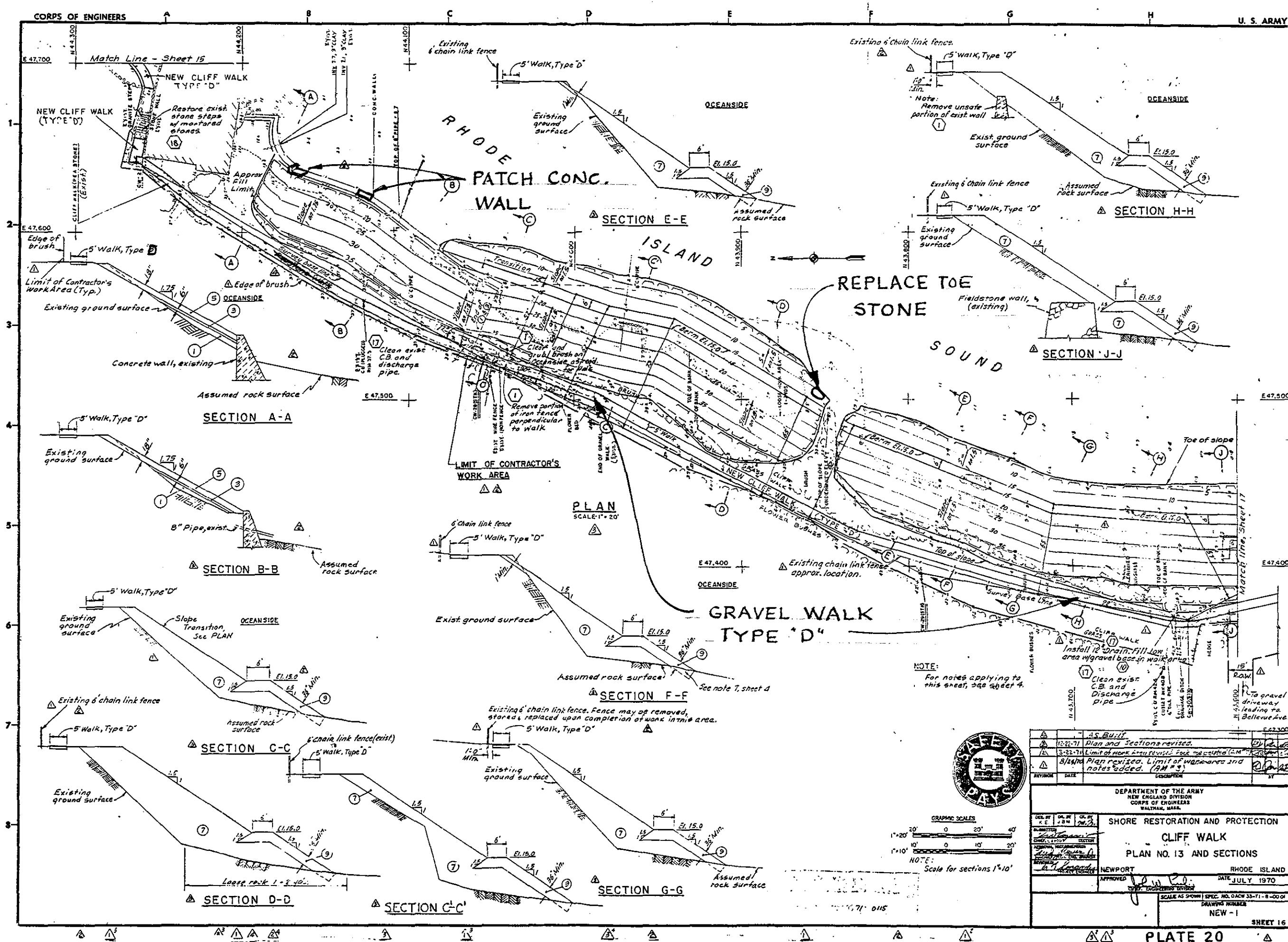


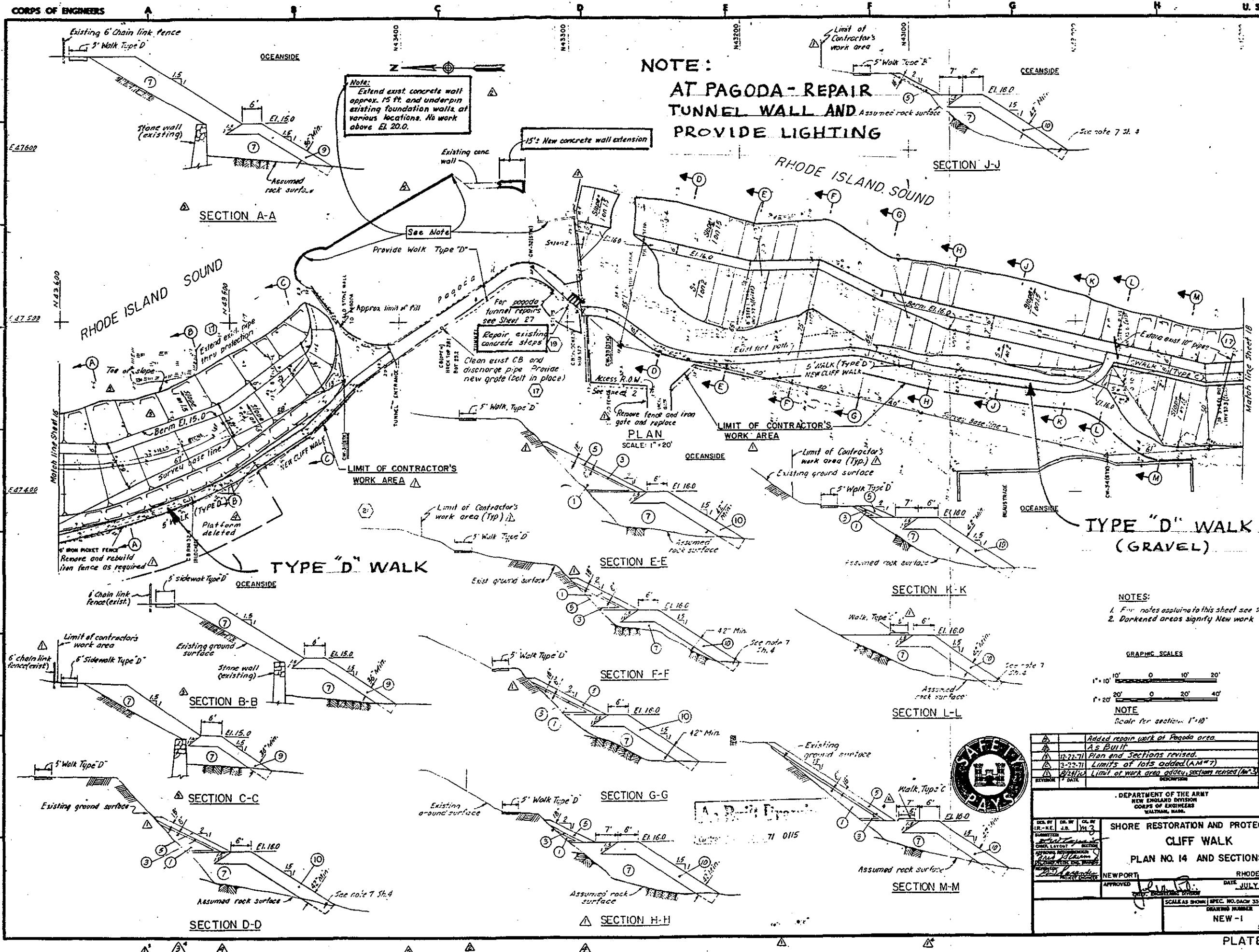


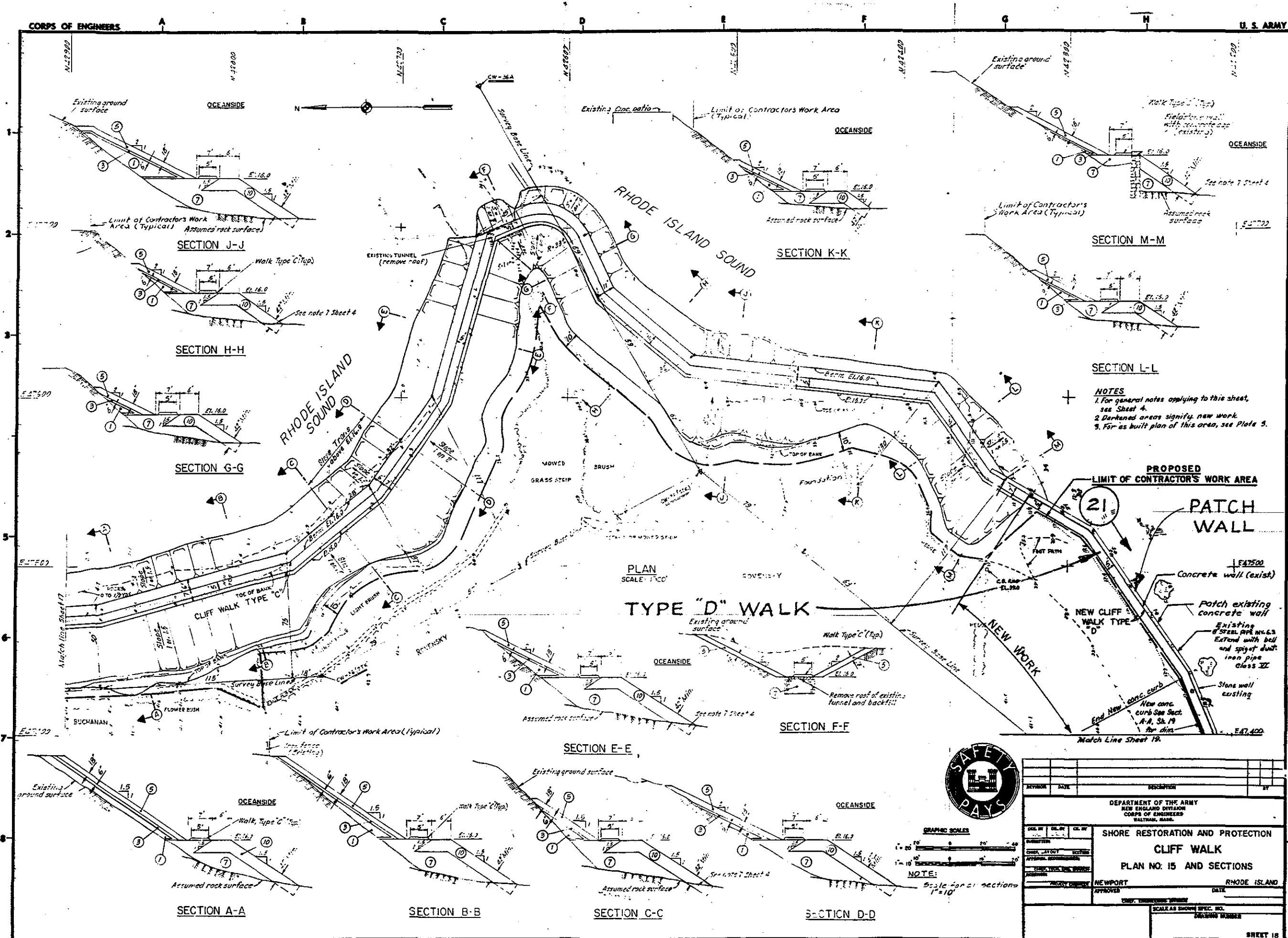


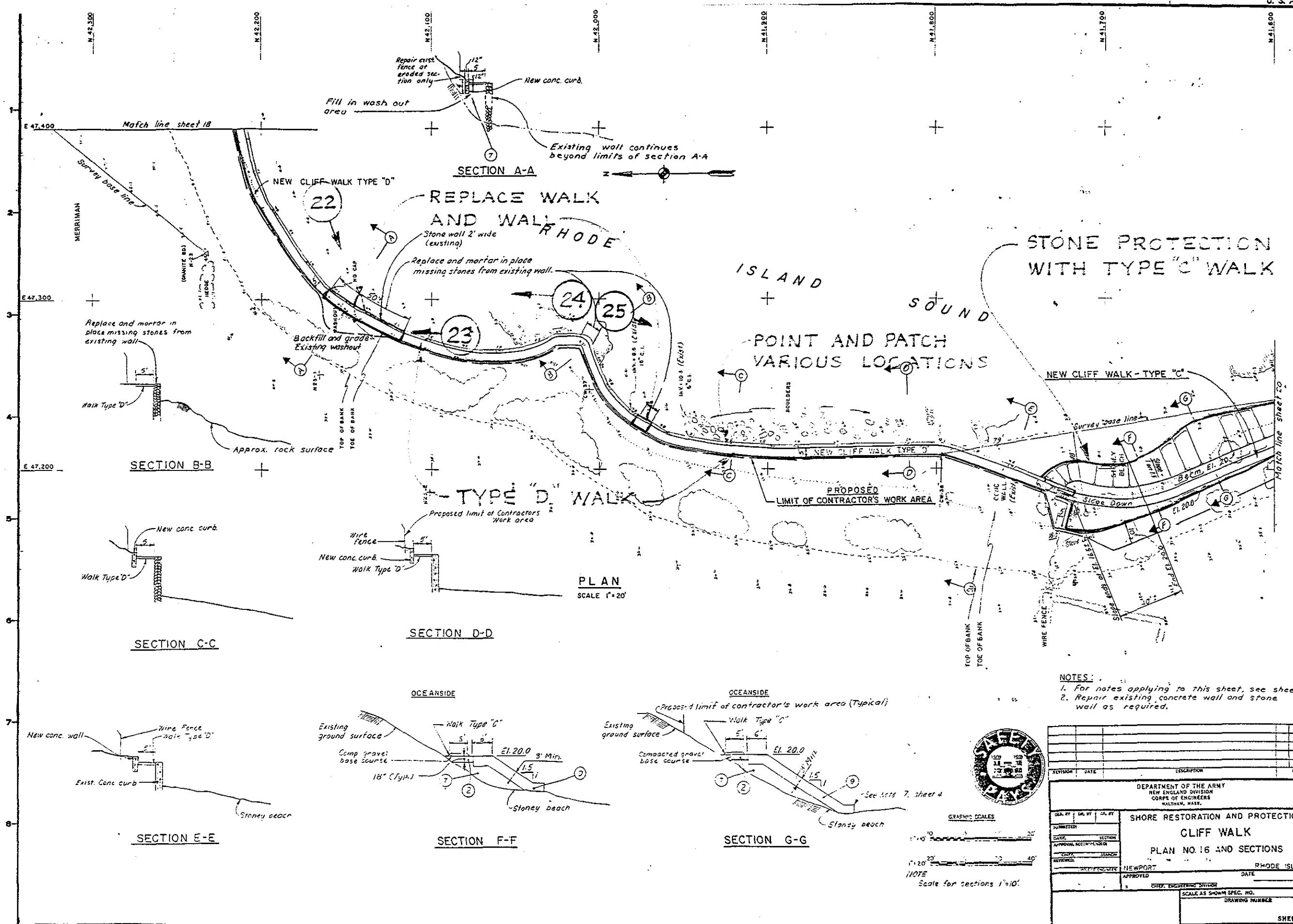


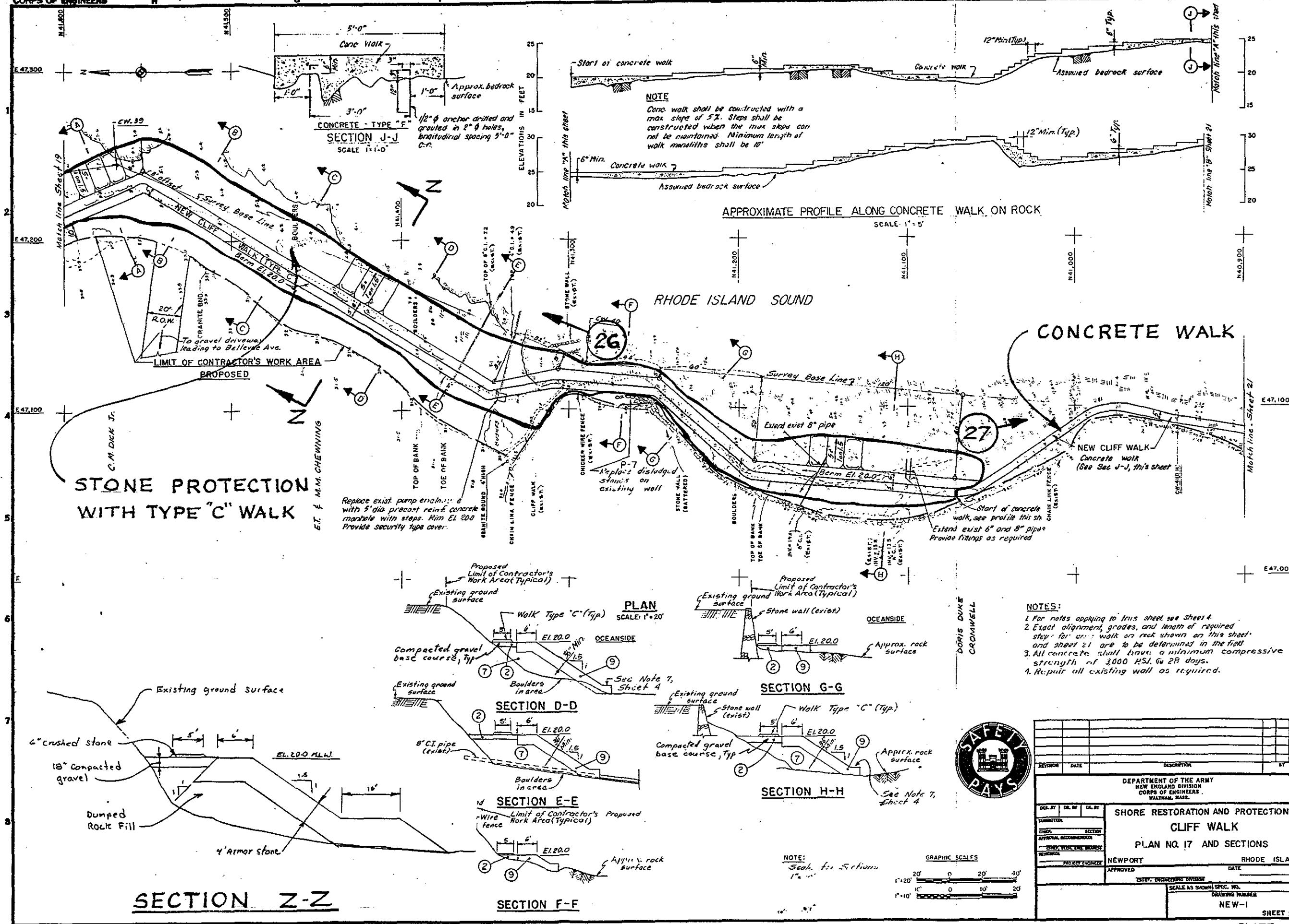


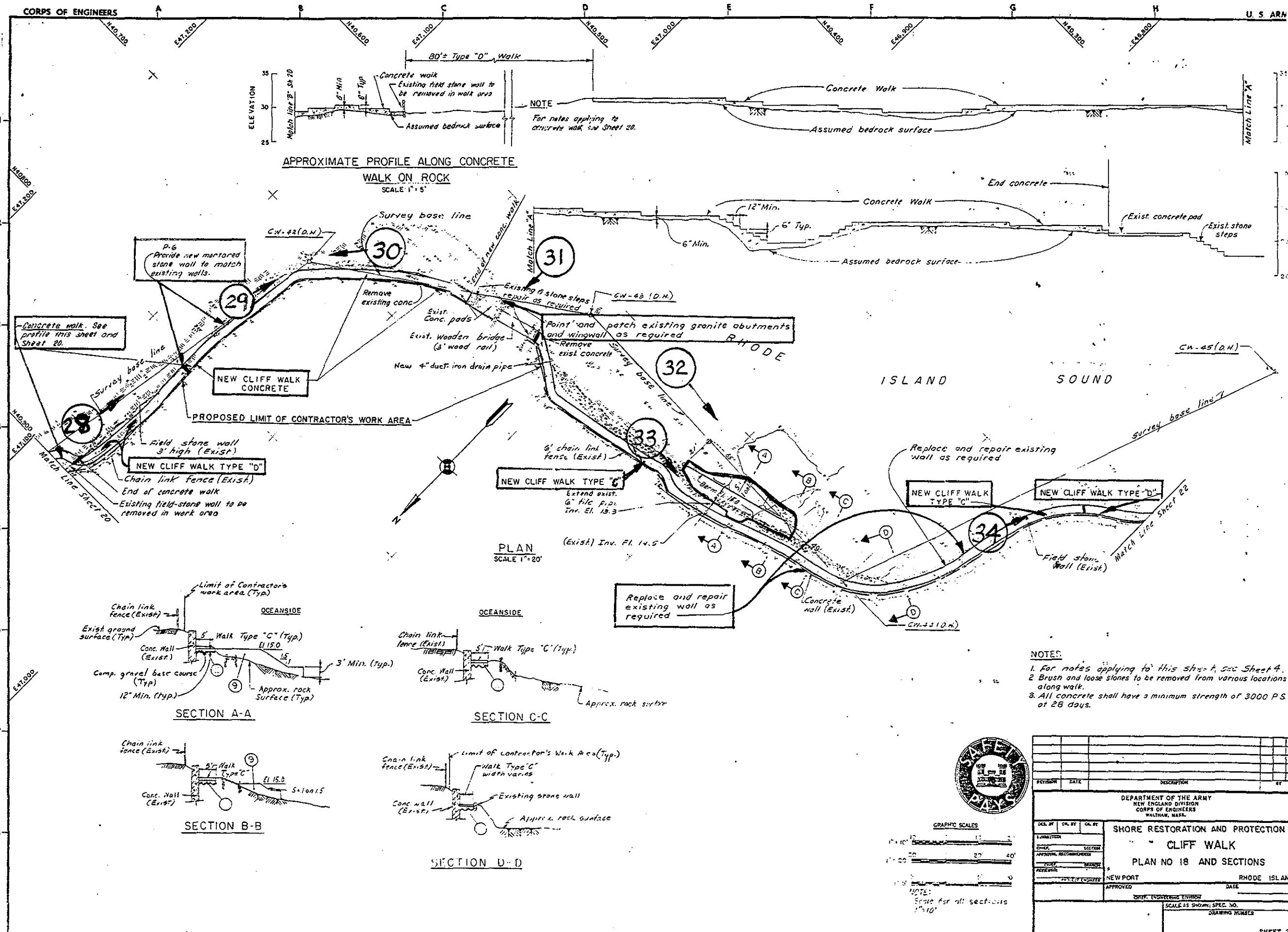


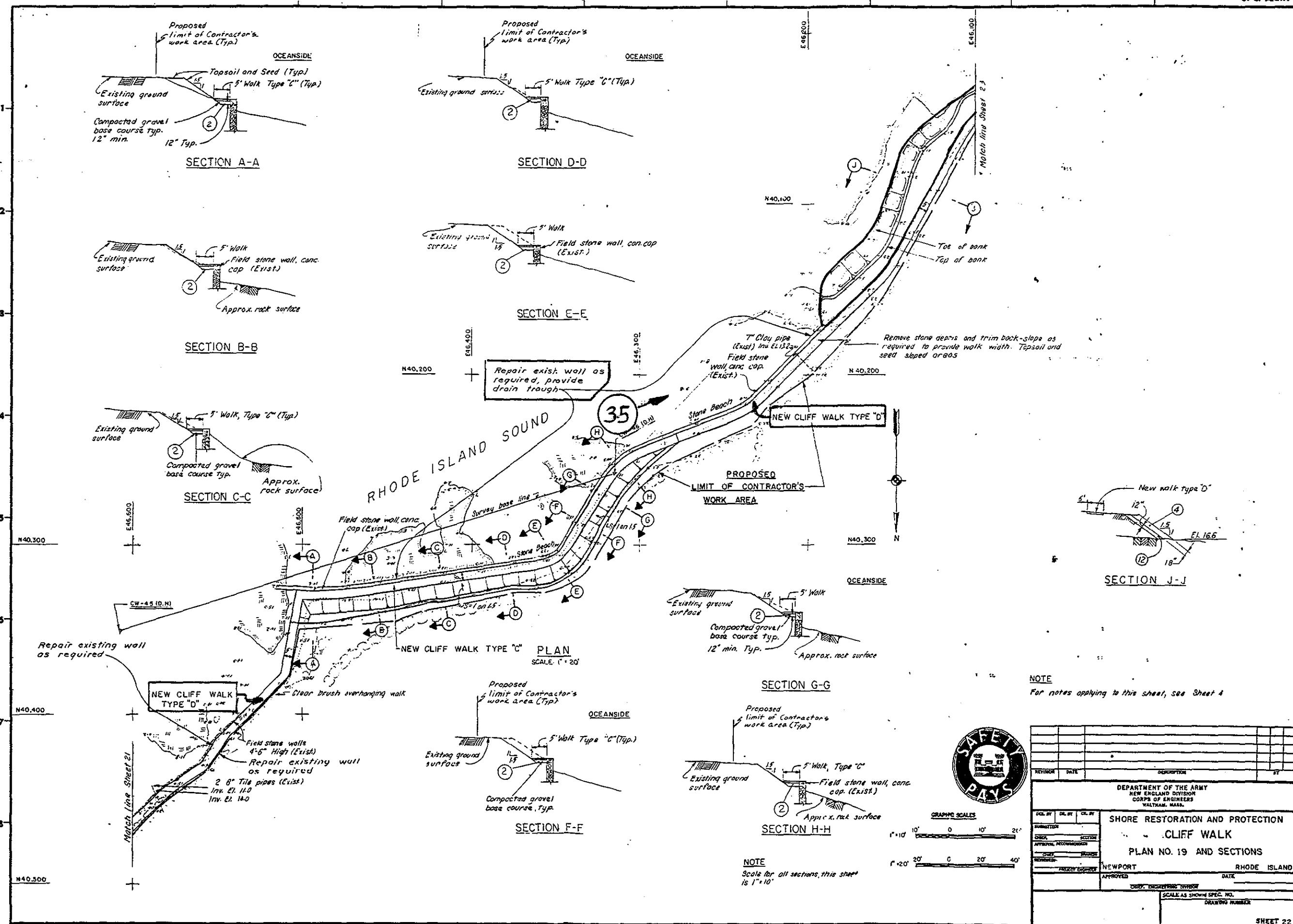


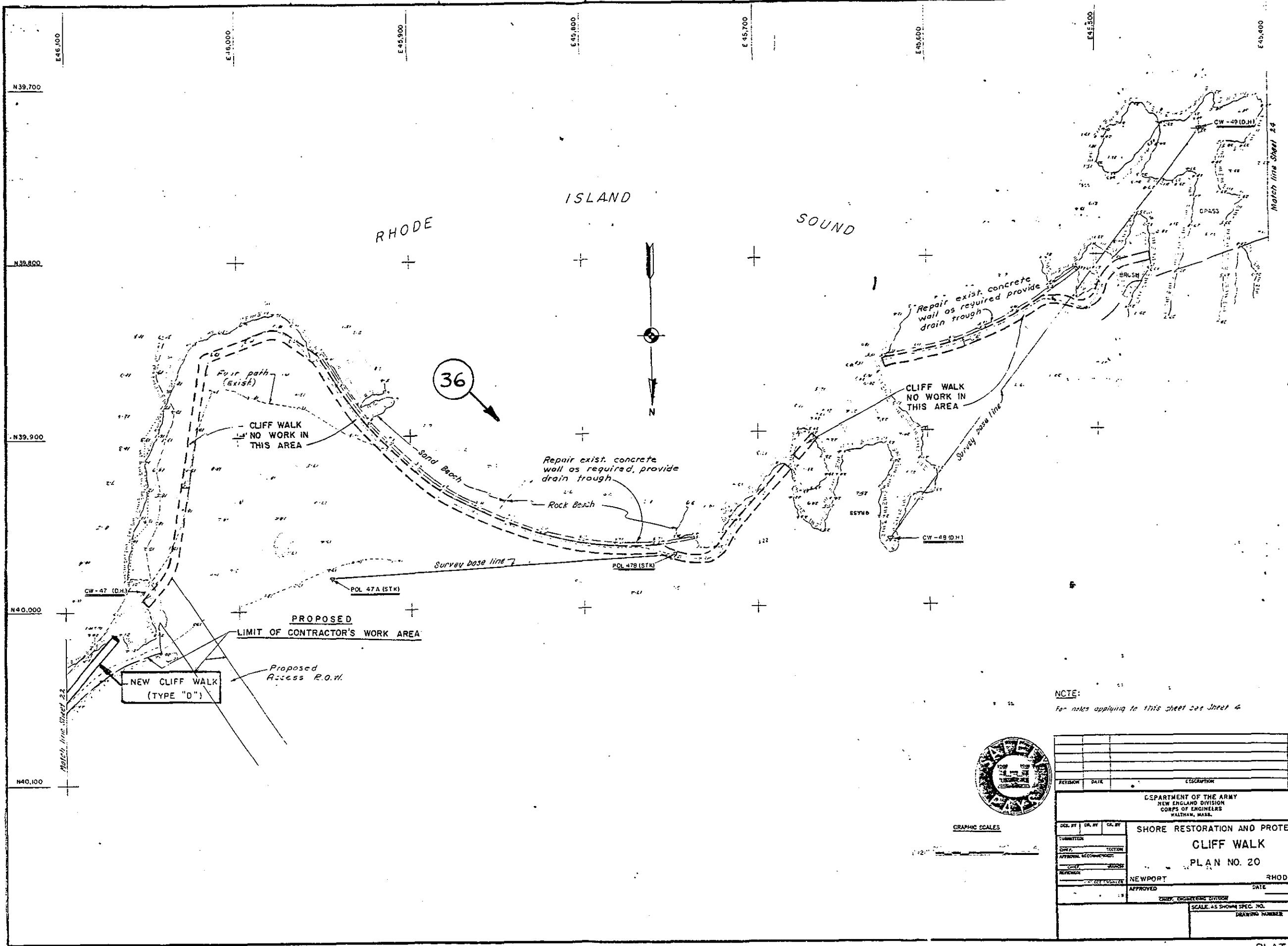


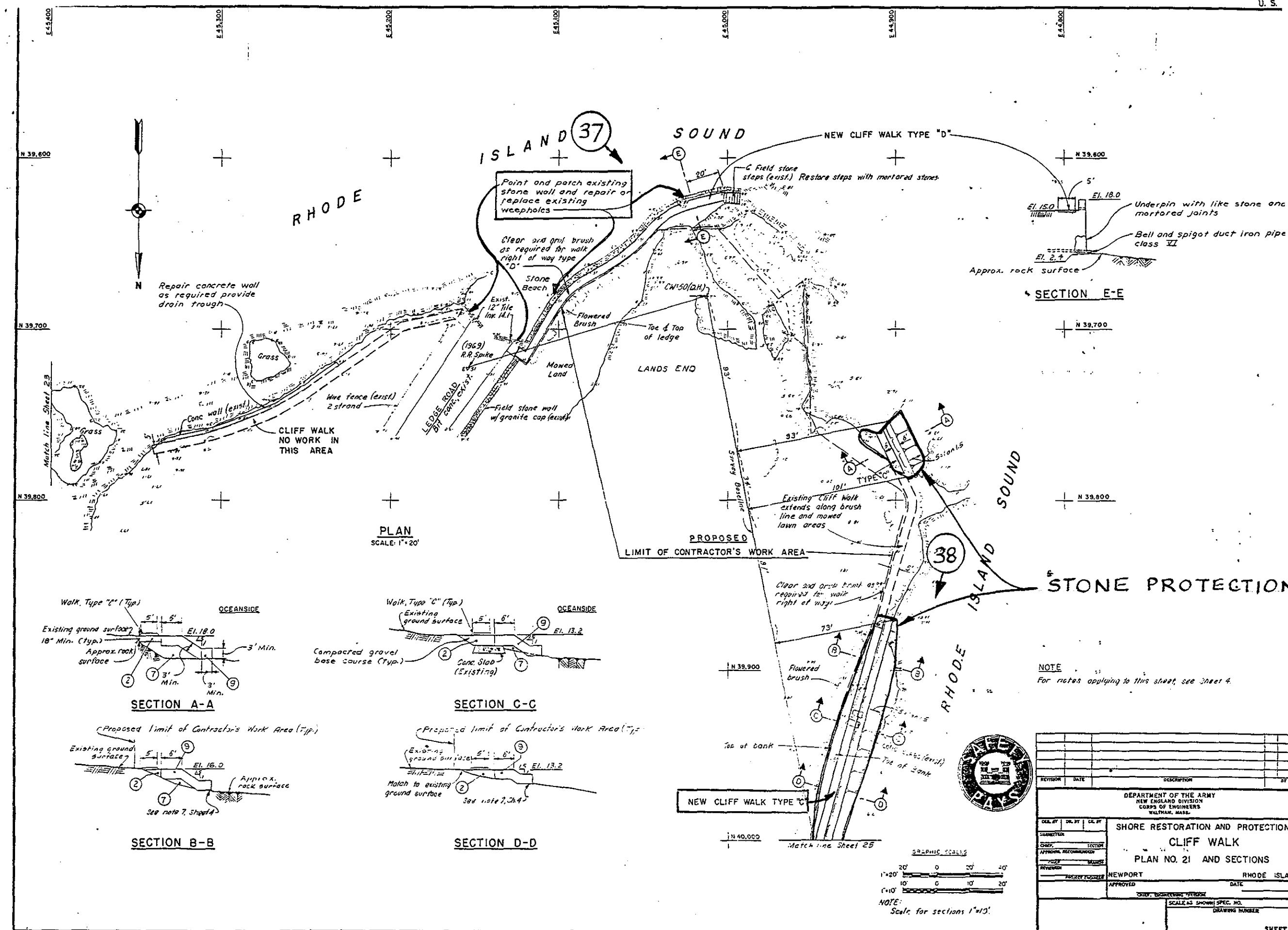


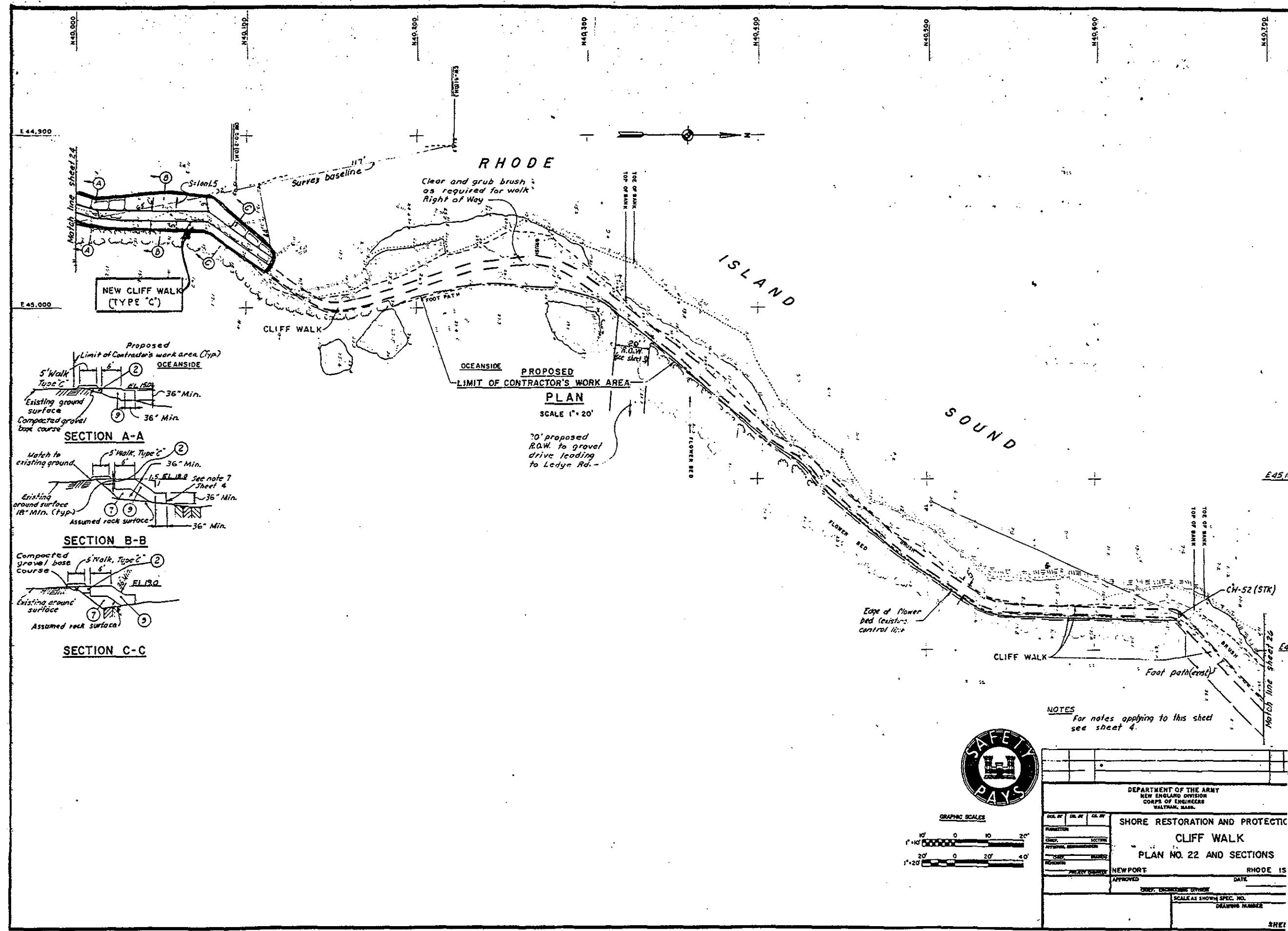


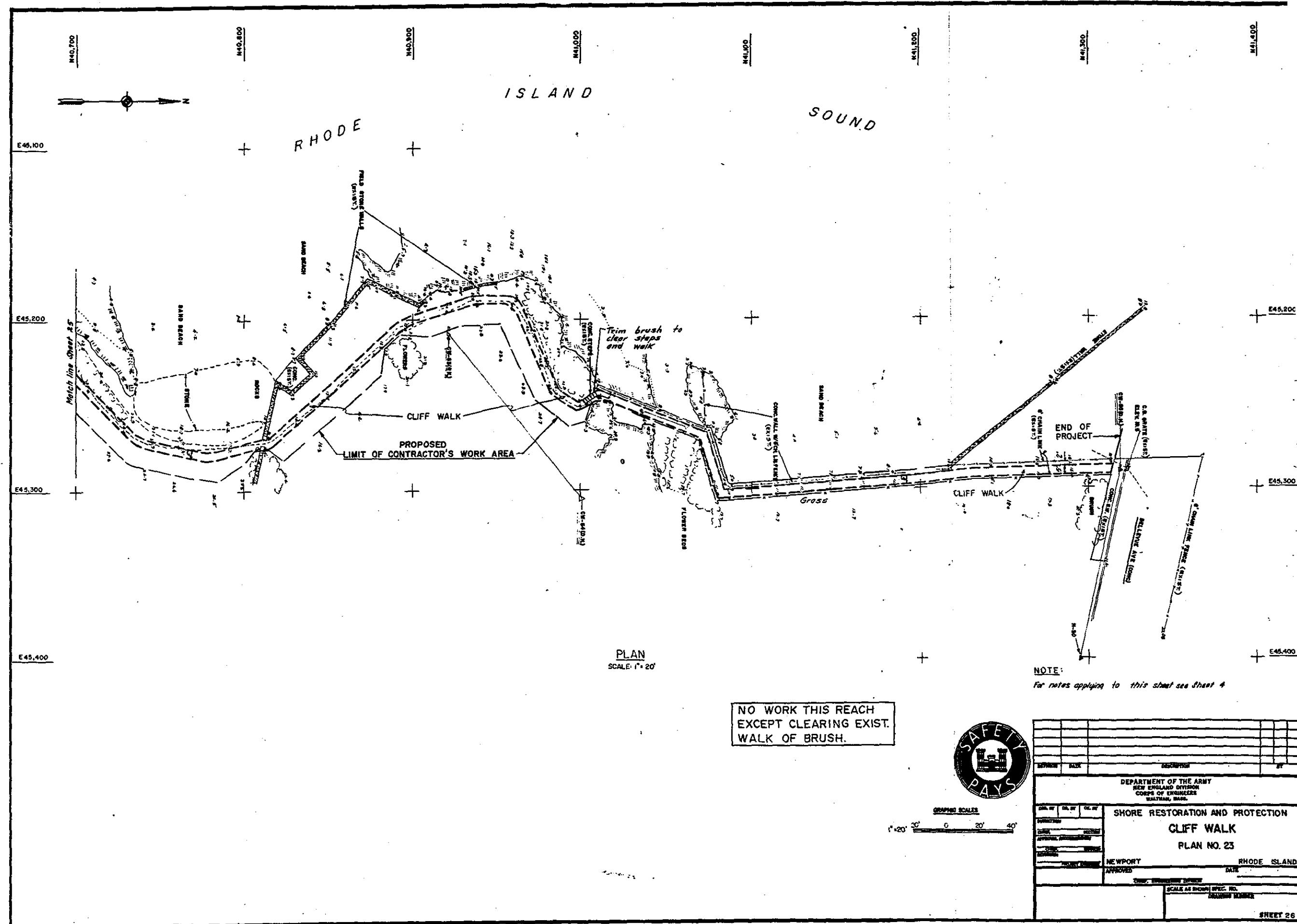










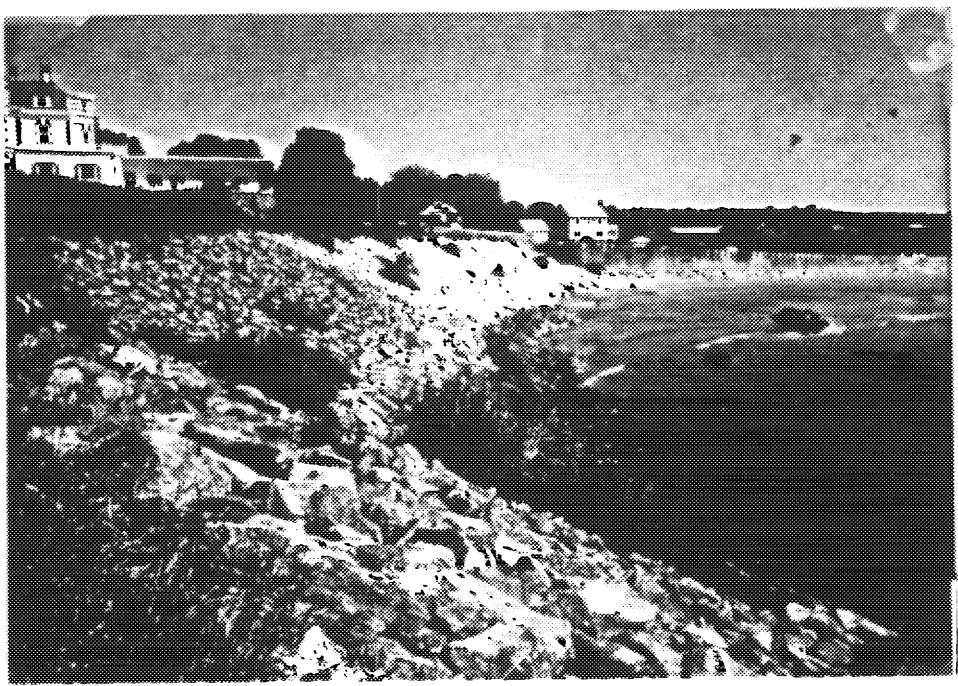


NOTE:
For notes applying to this sheet see Sheet 4



APPENDIX B

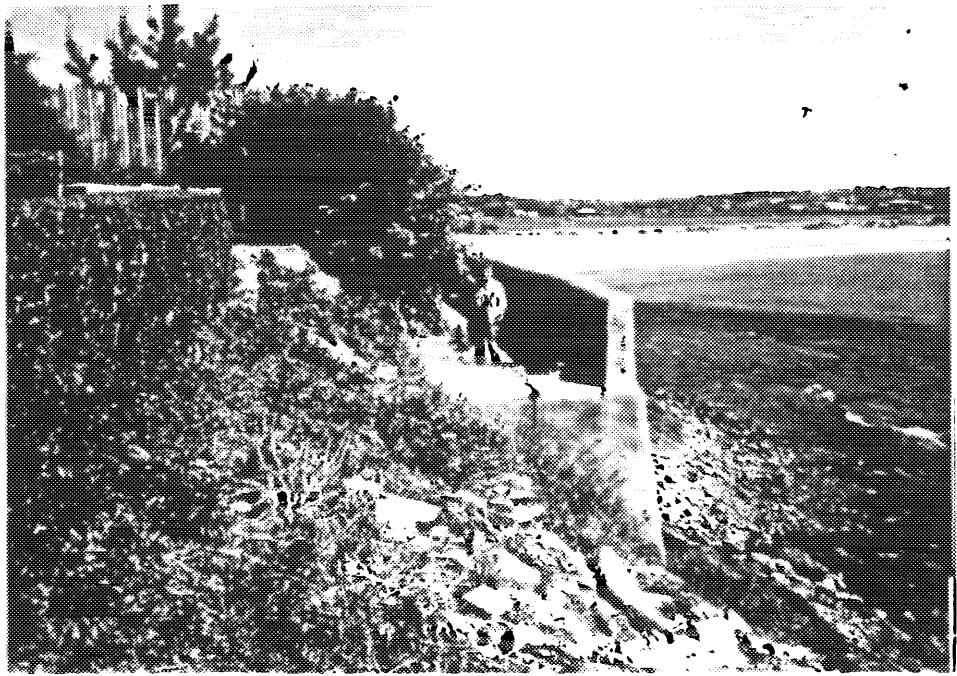
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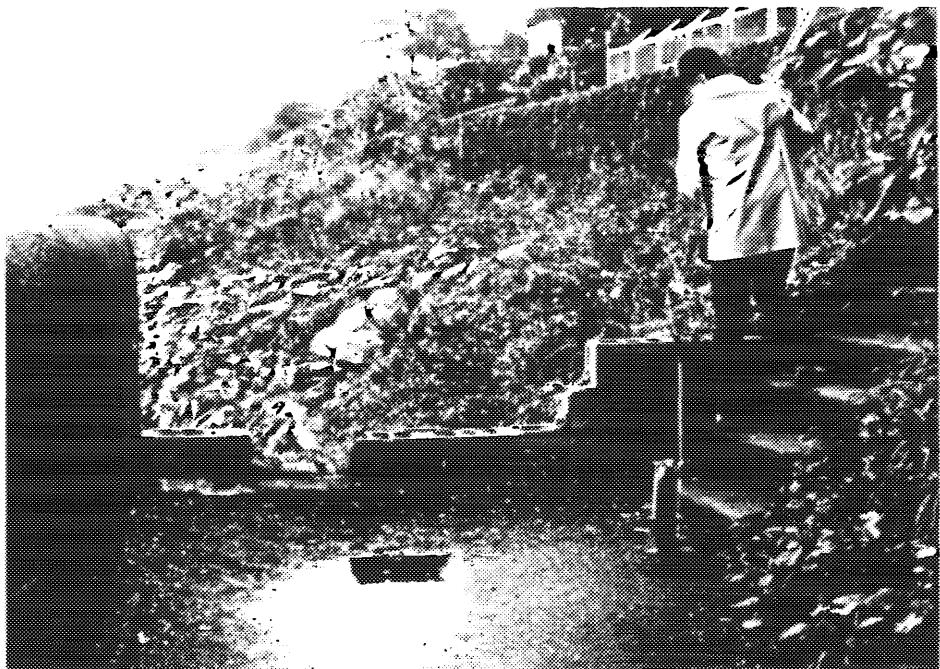
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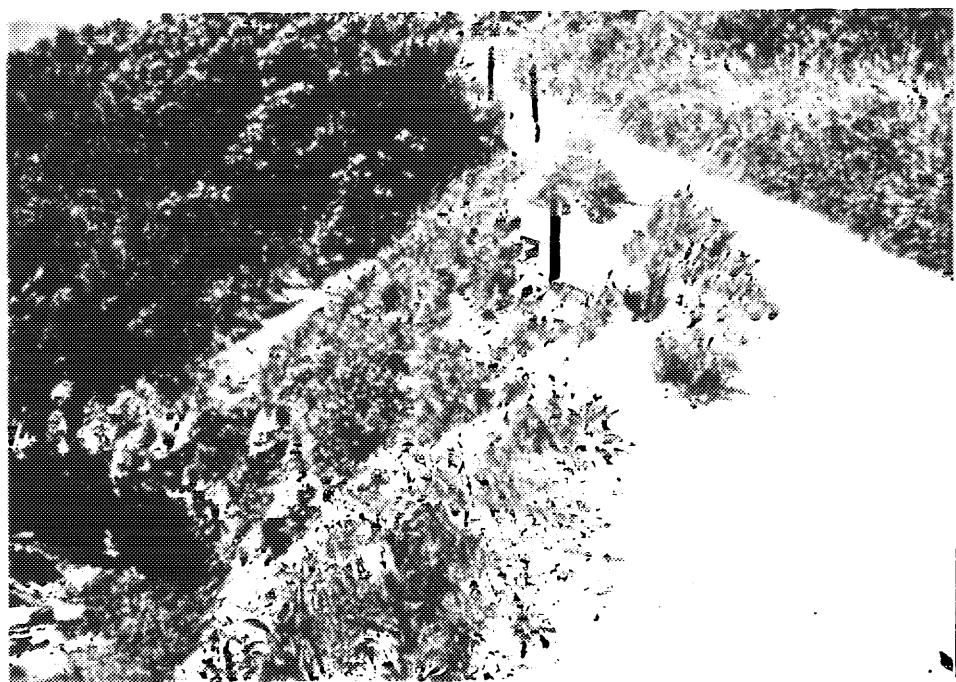
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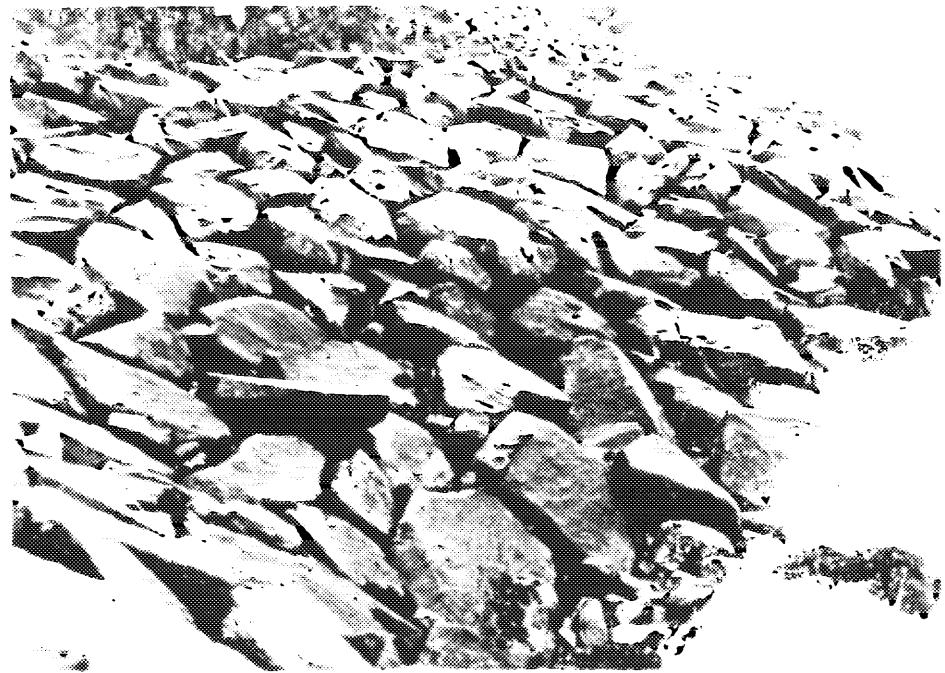
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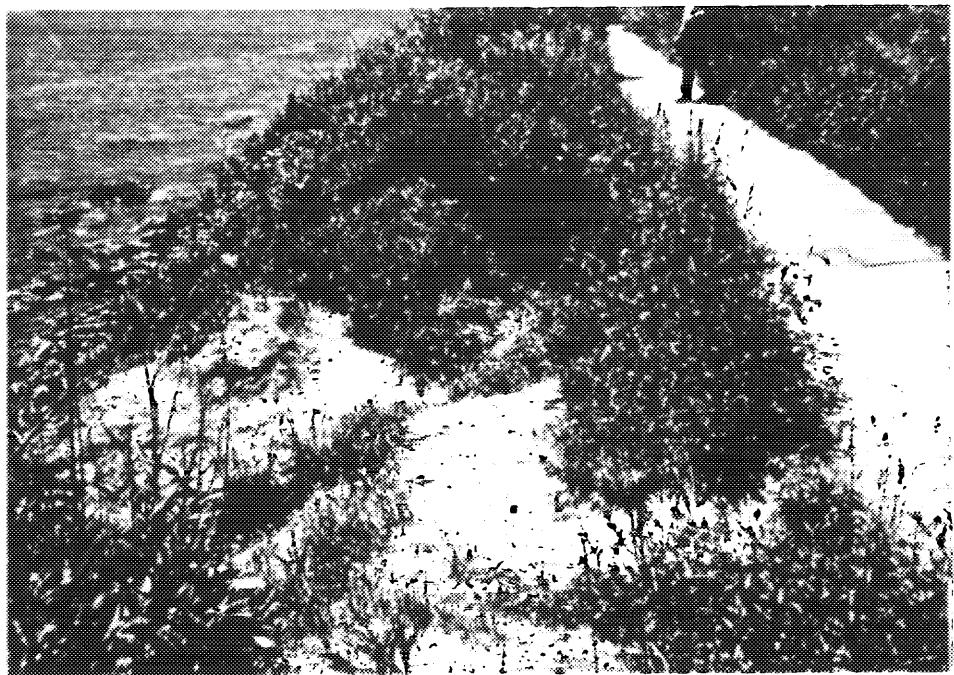
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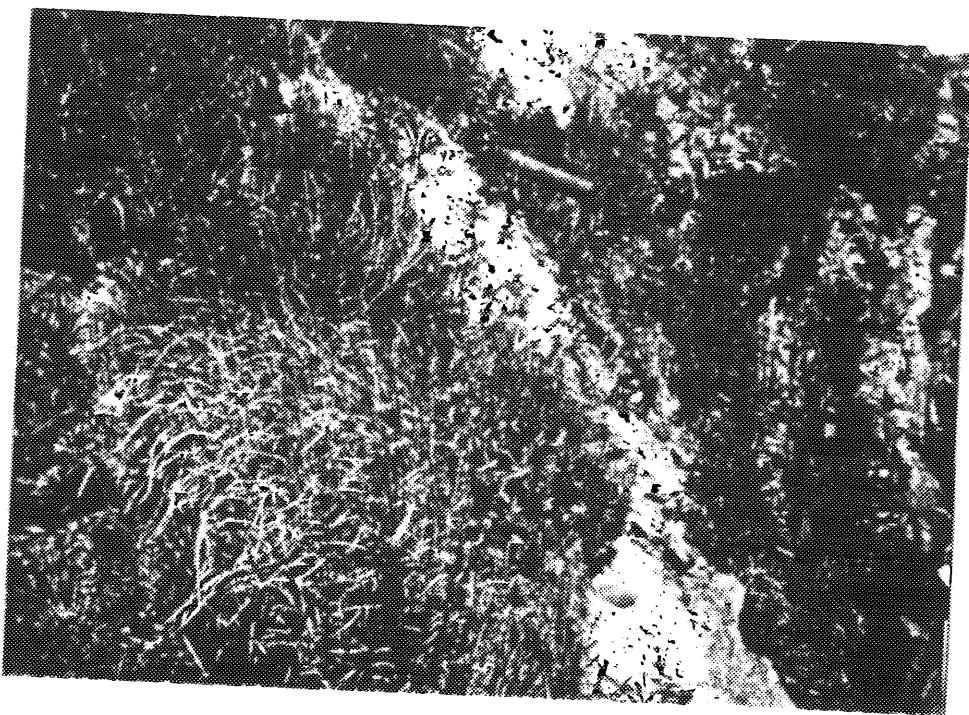
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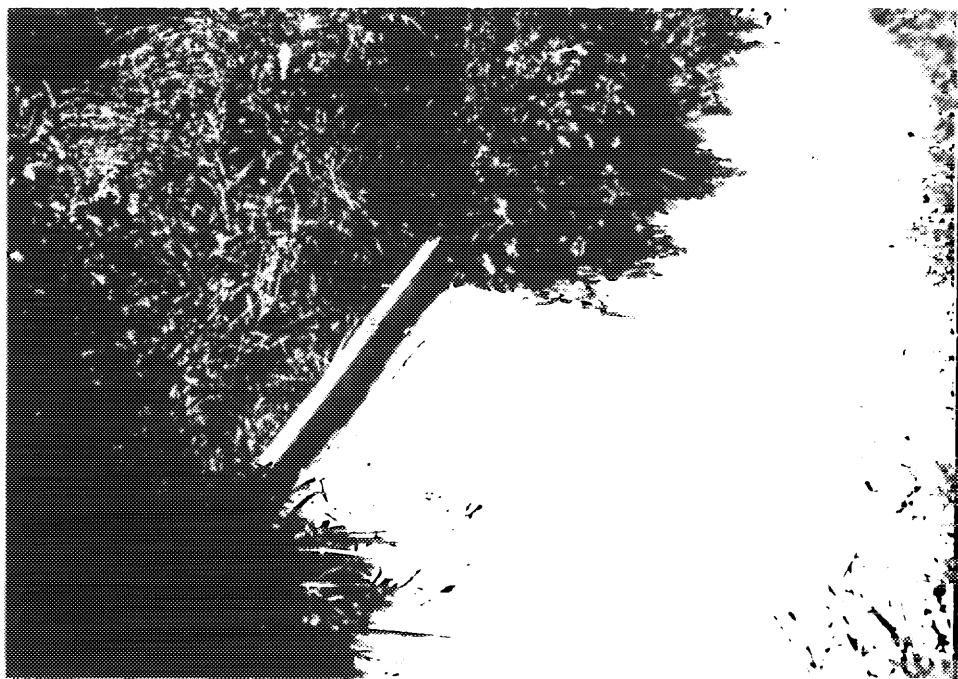
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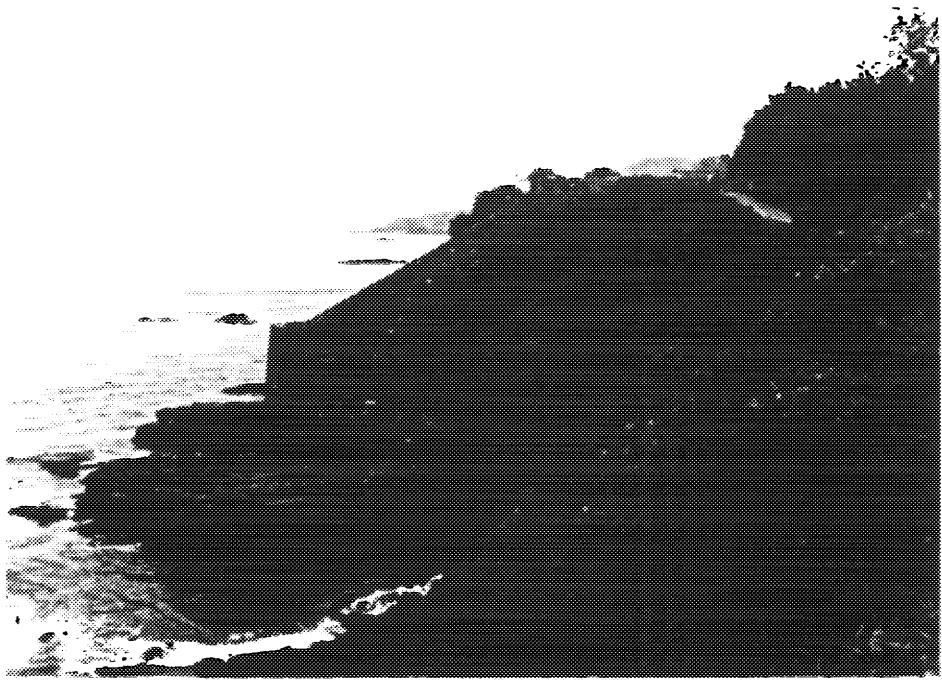
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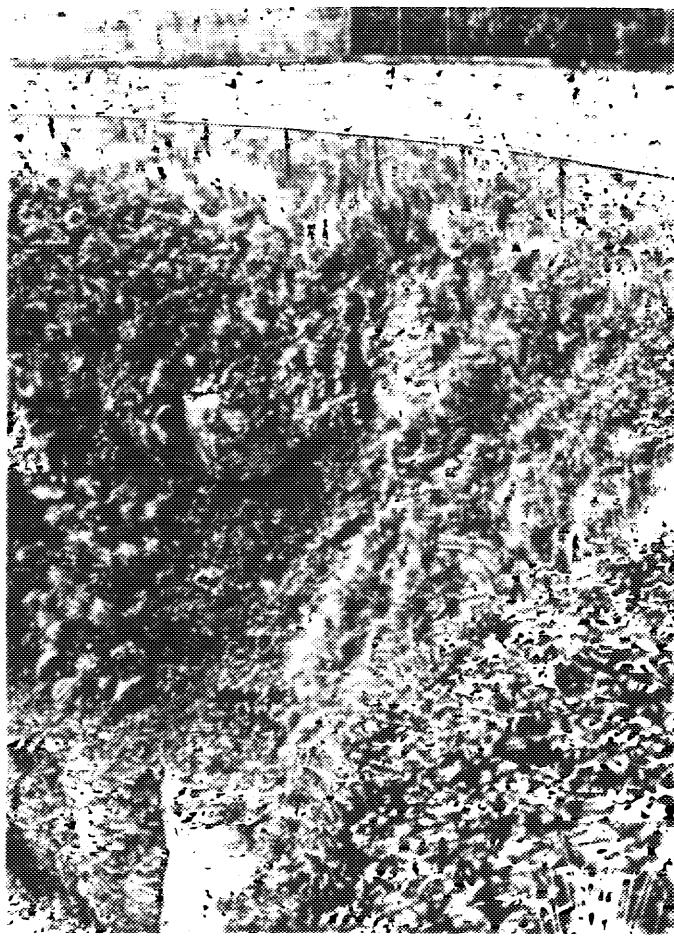
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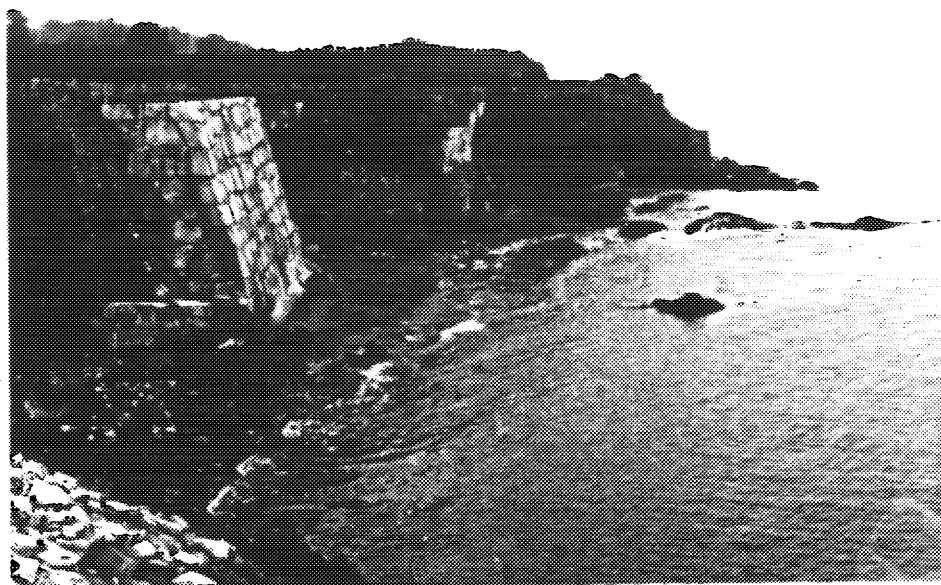
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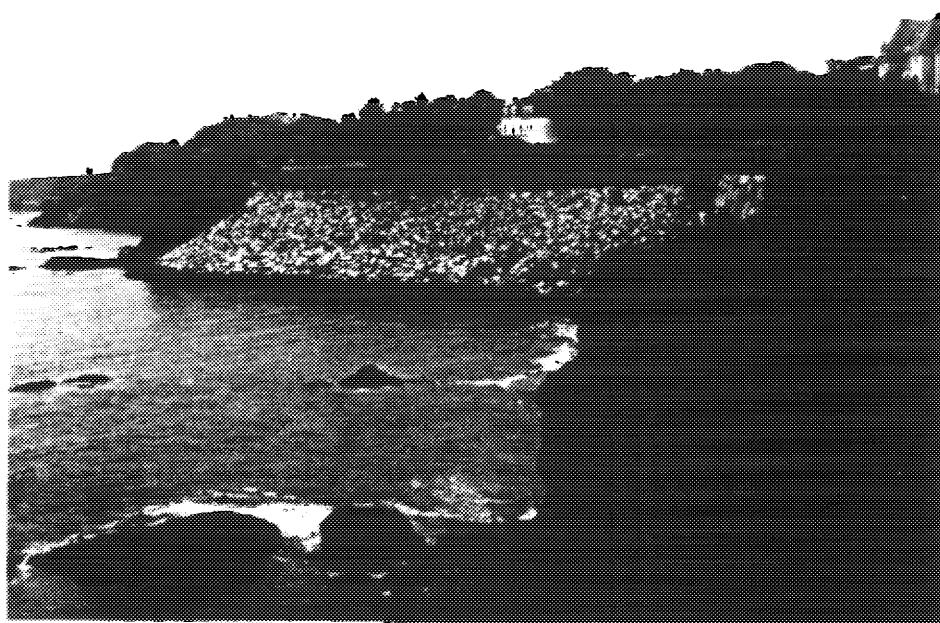
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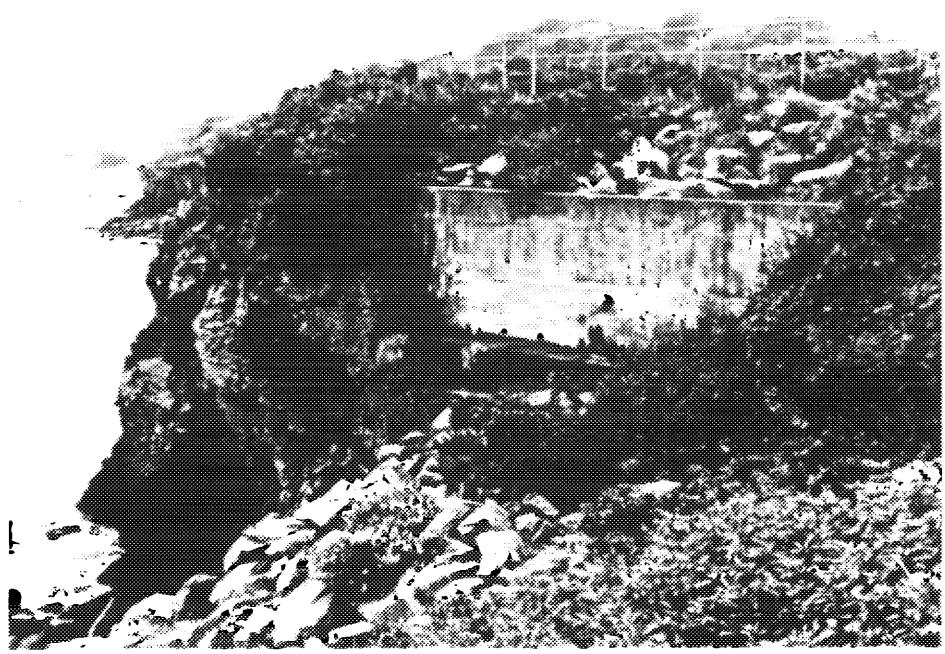
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(13)



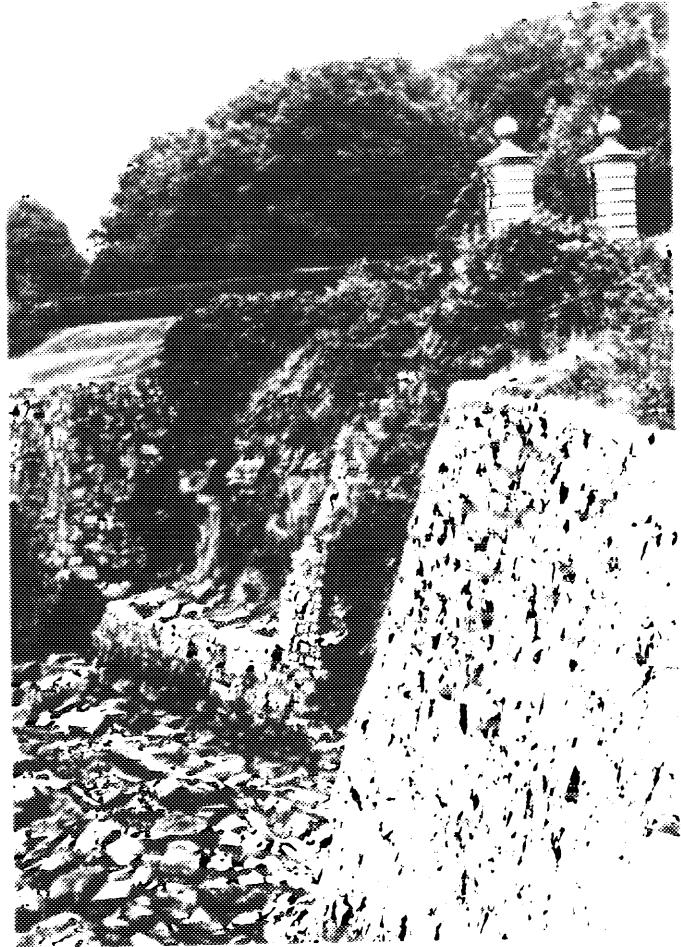
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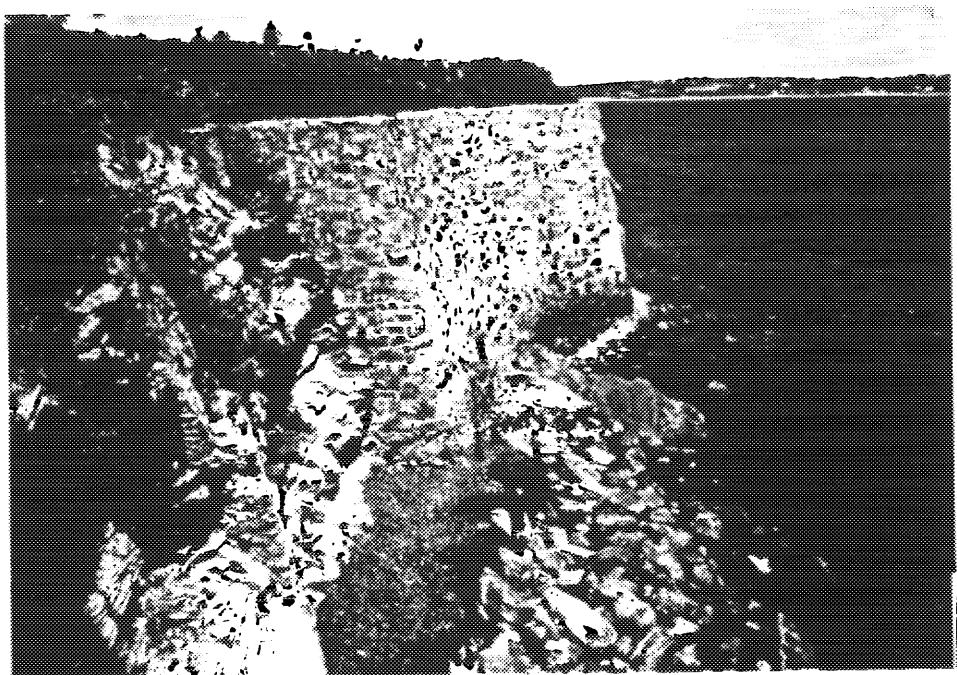
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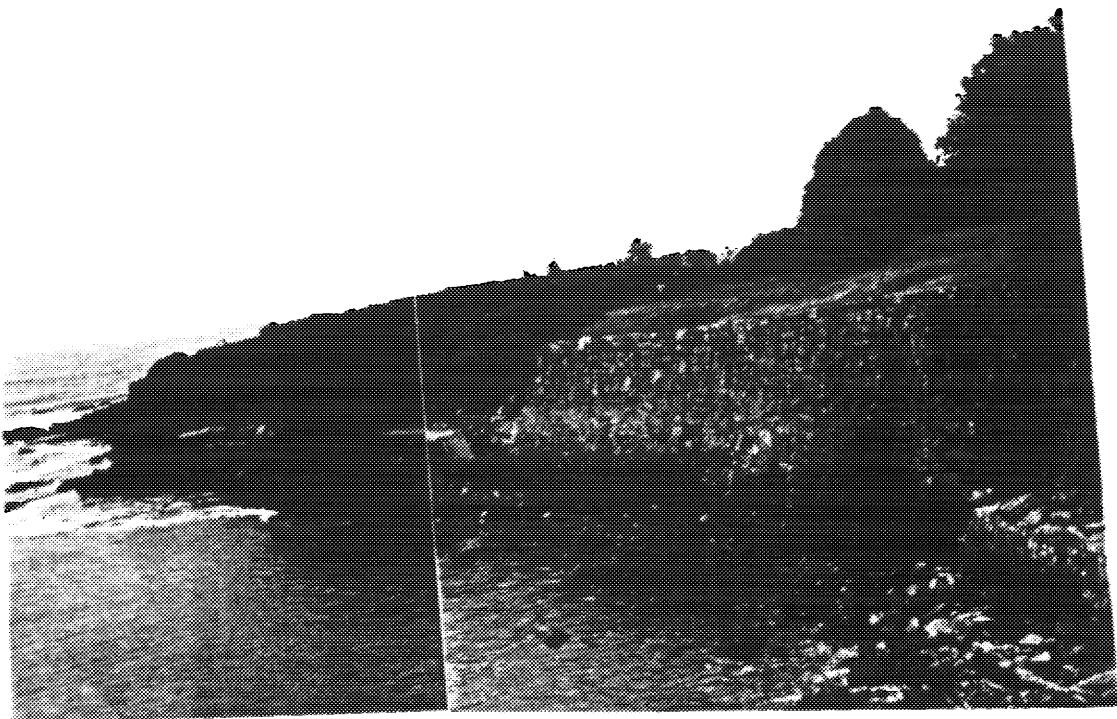
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16



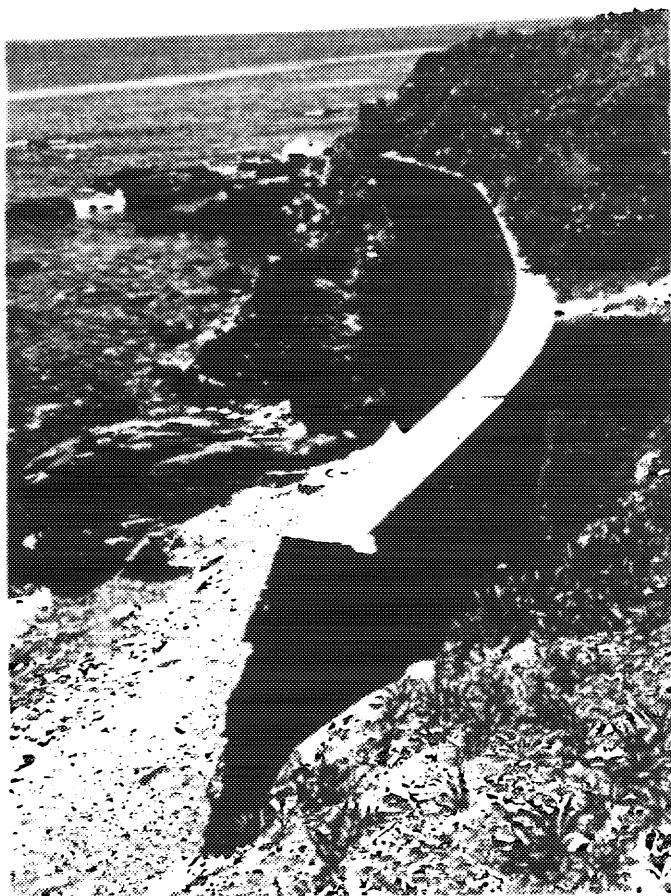
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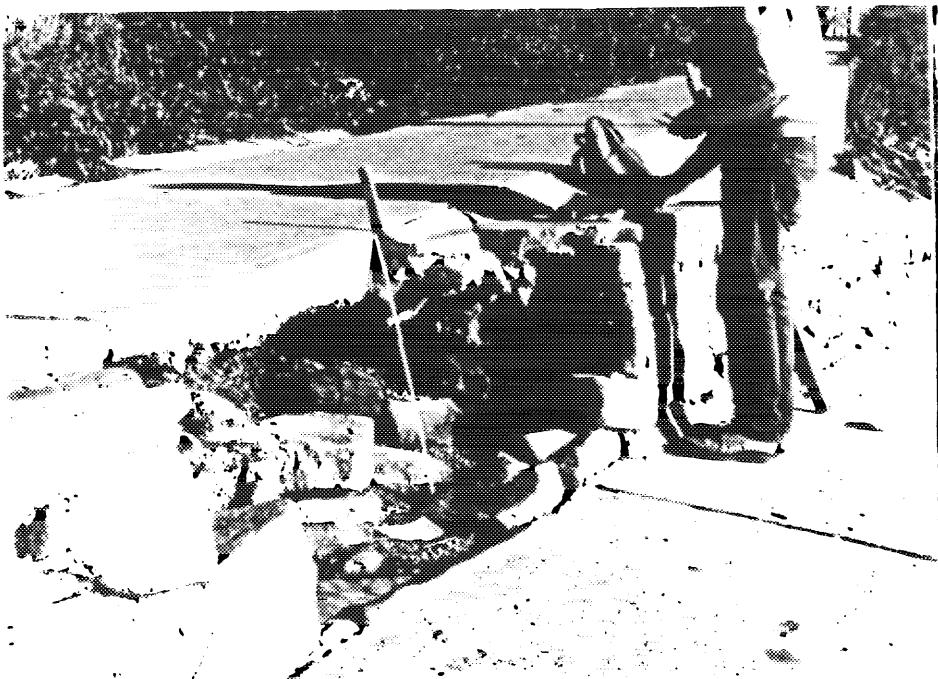
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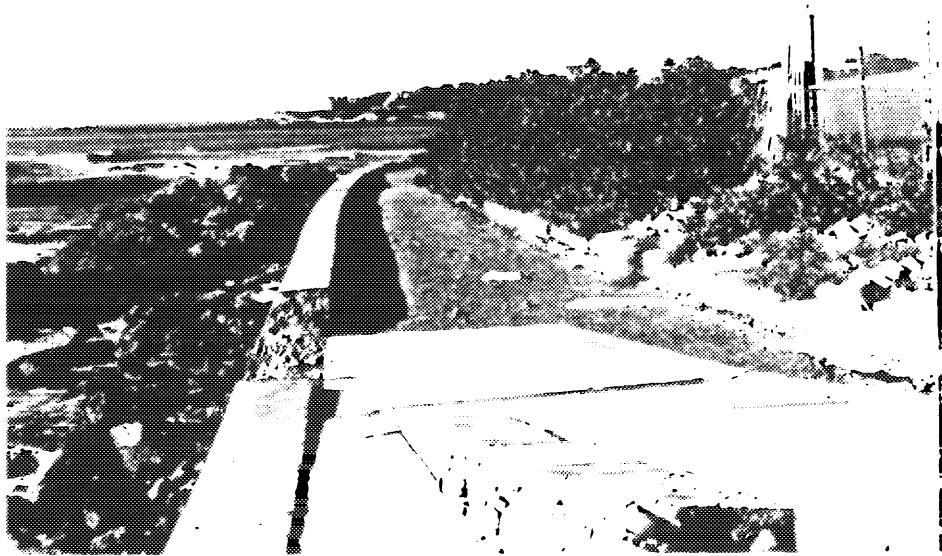
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18 A



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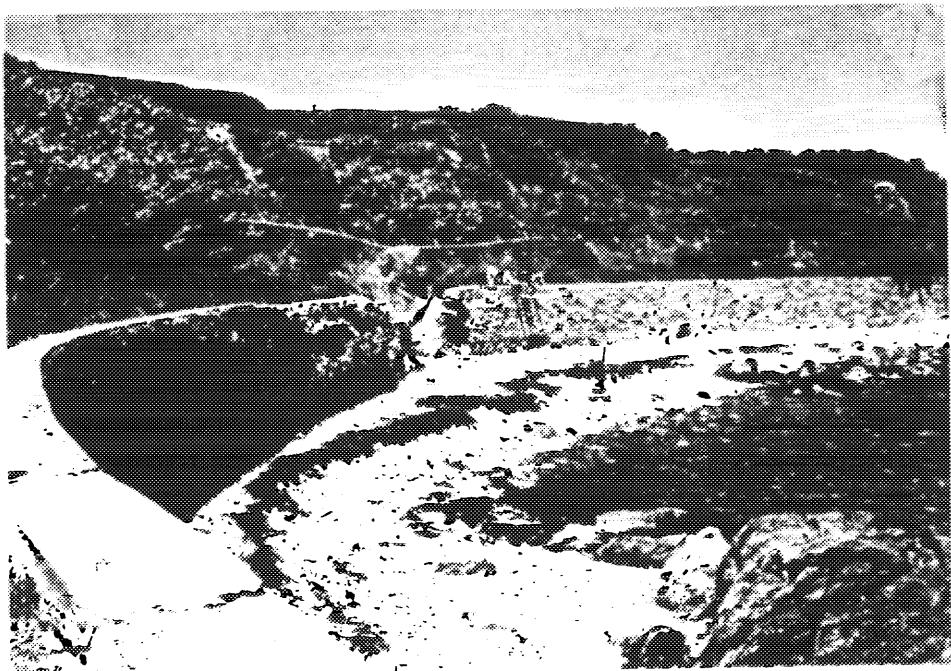
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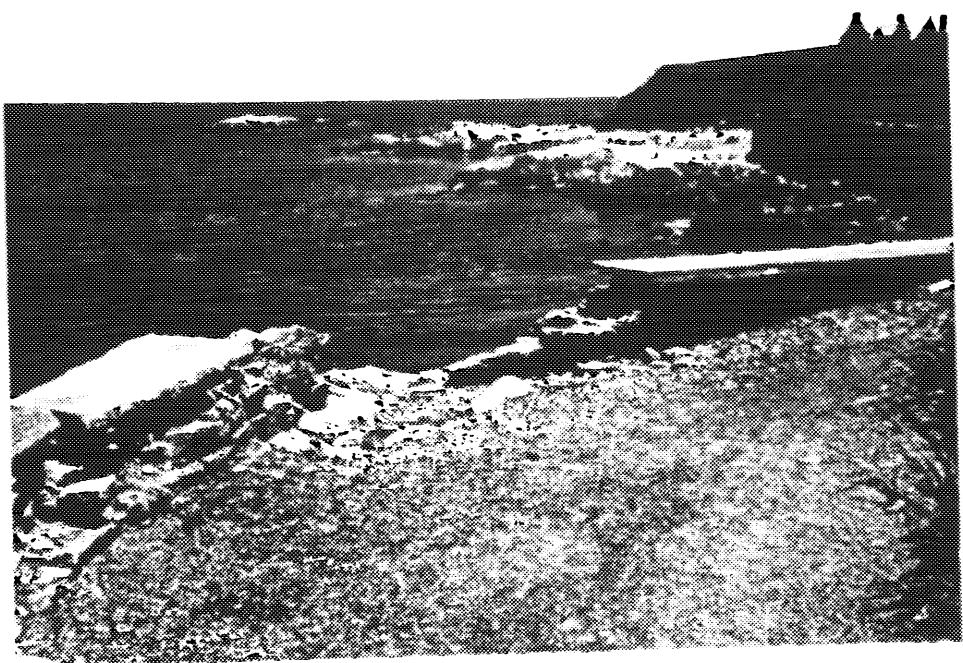
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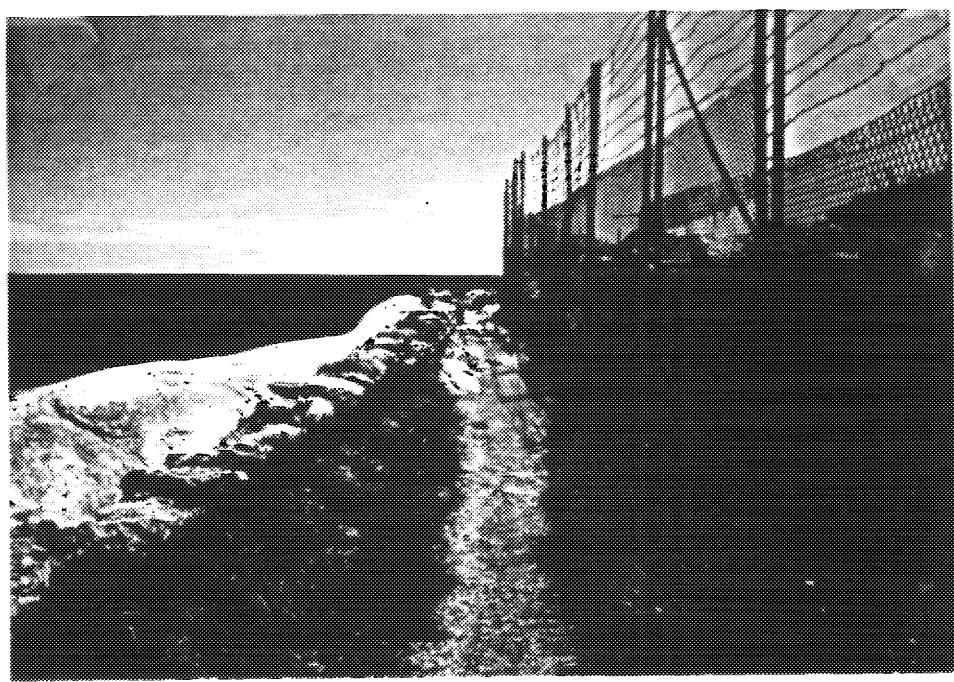
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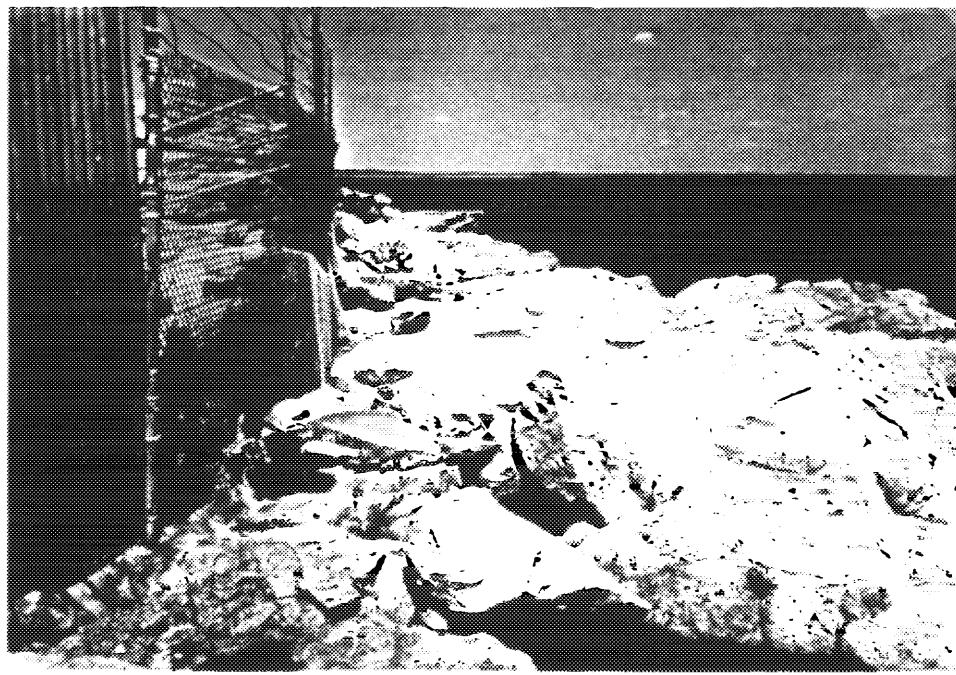
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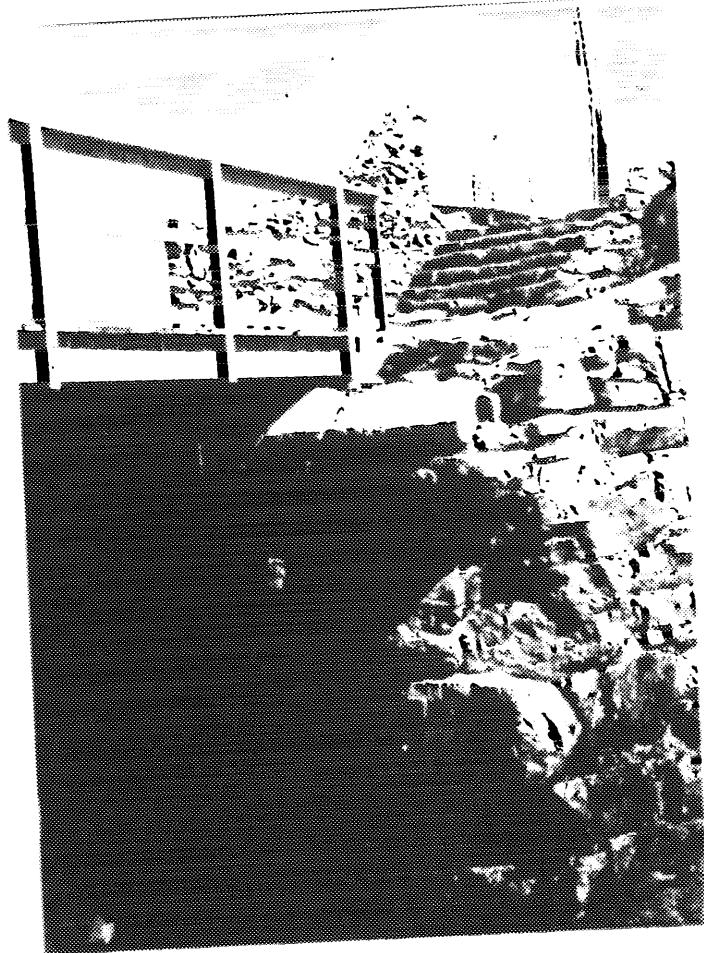
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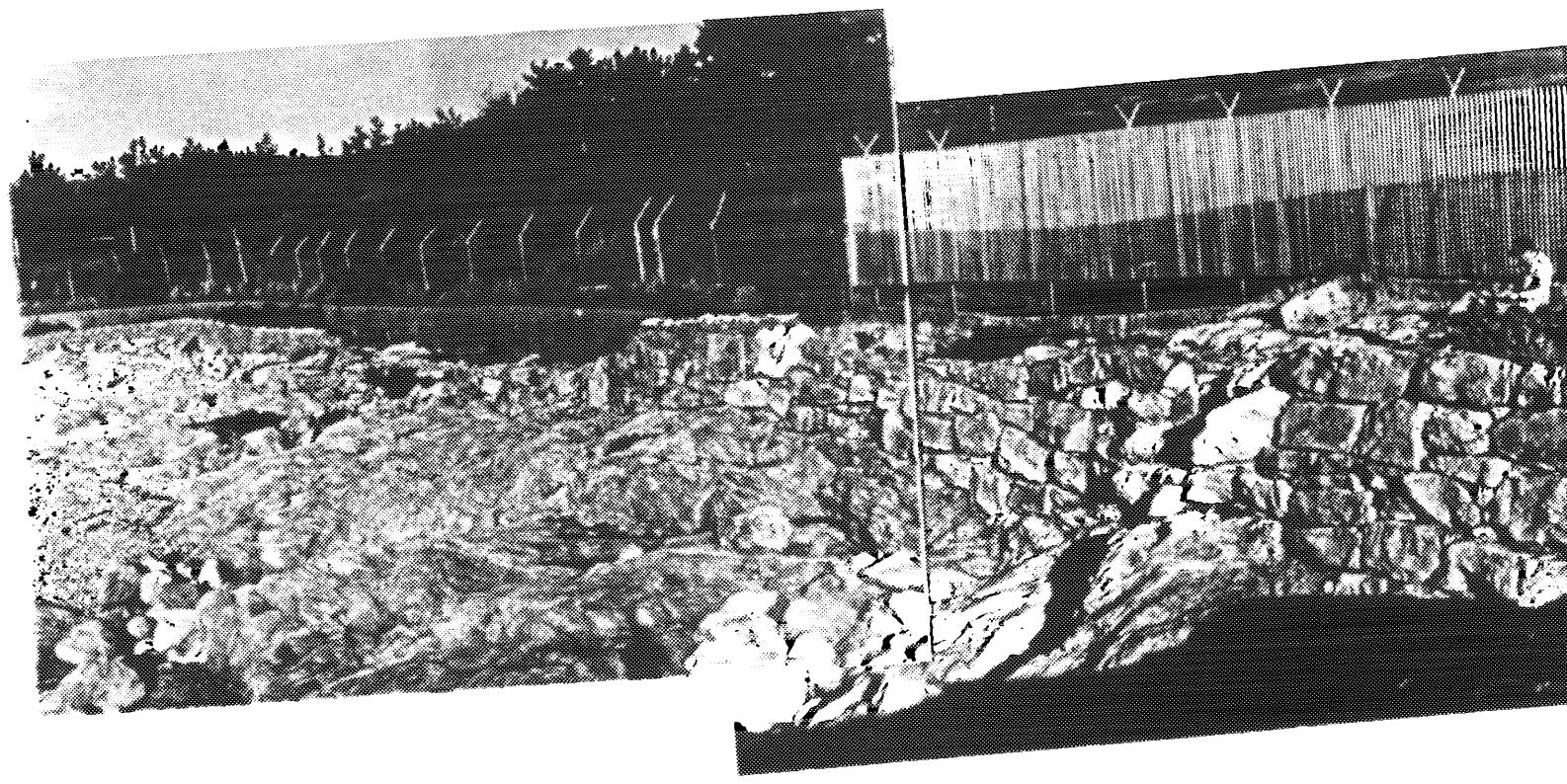
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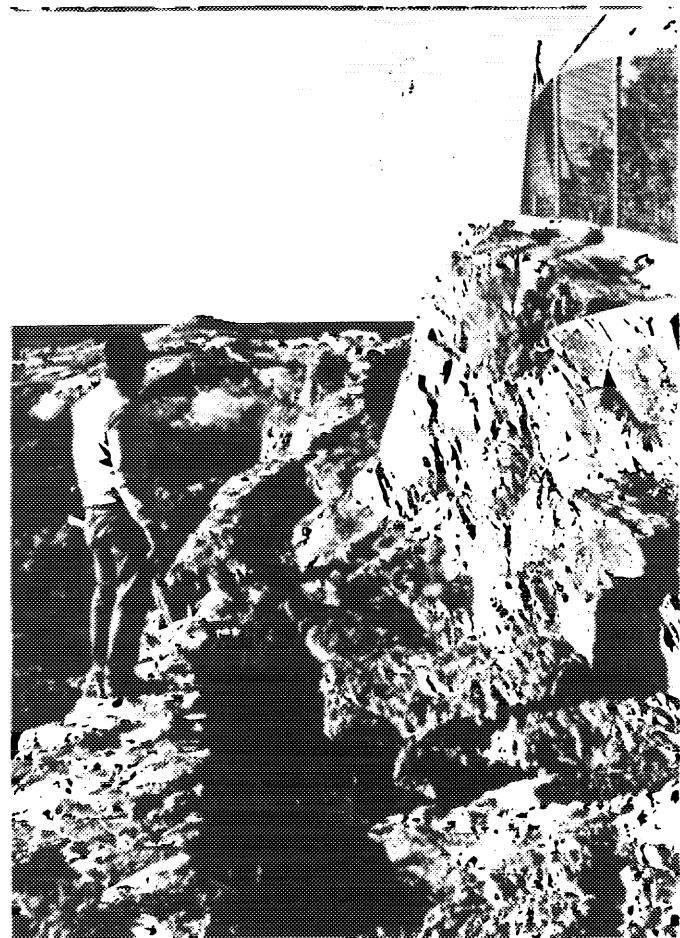
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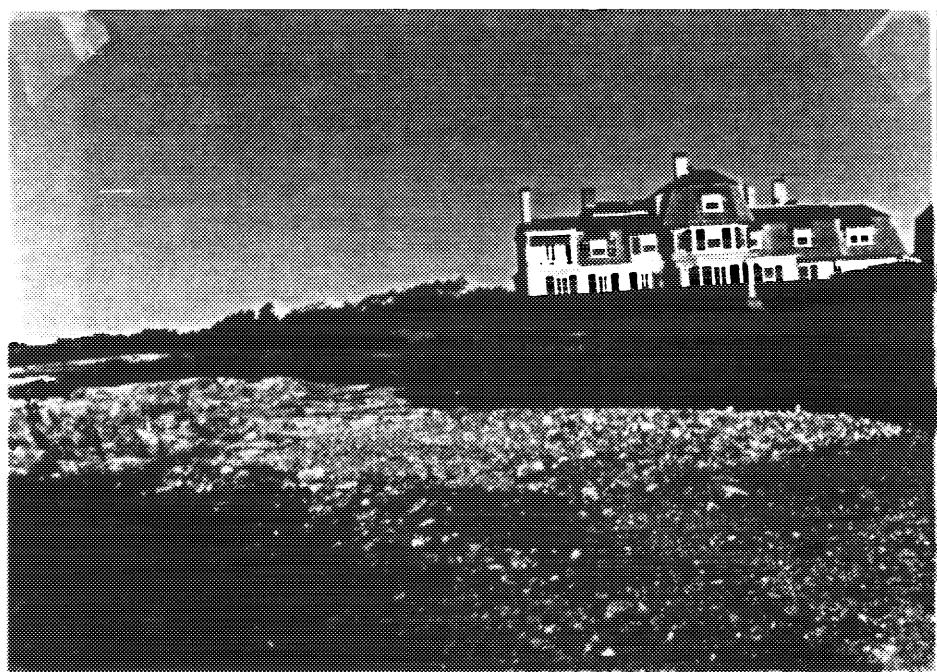
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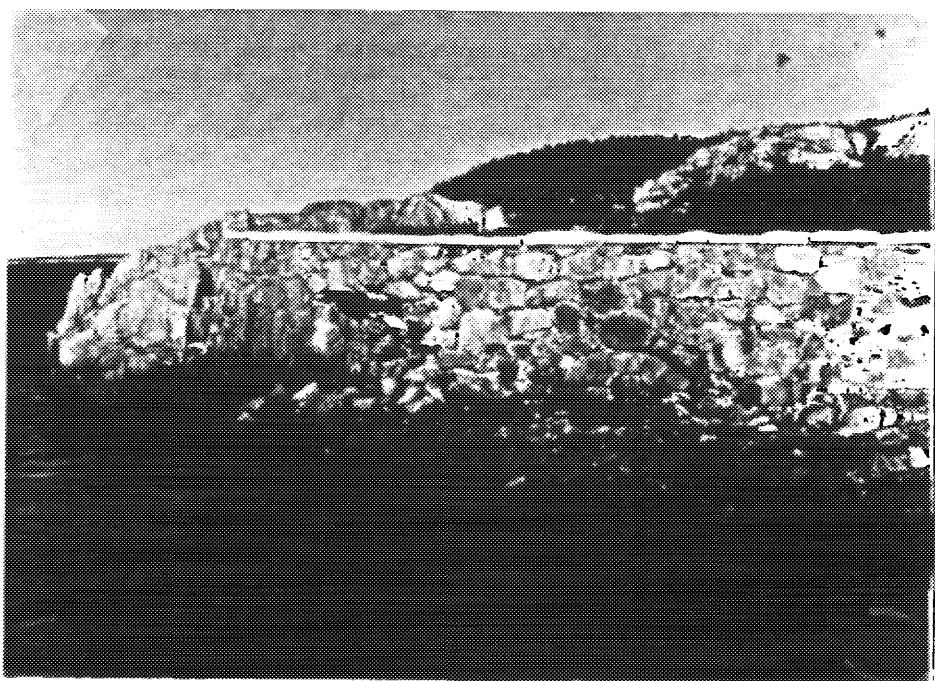
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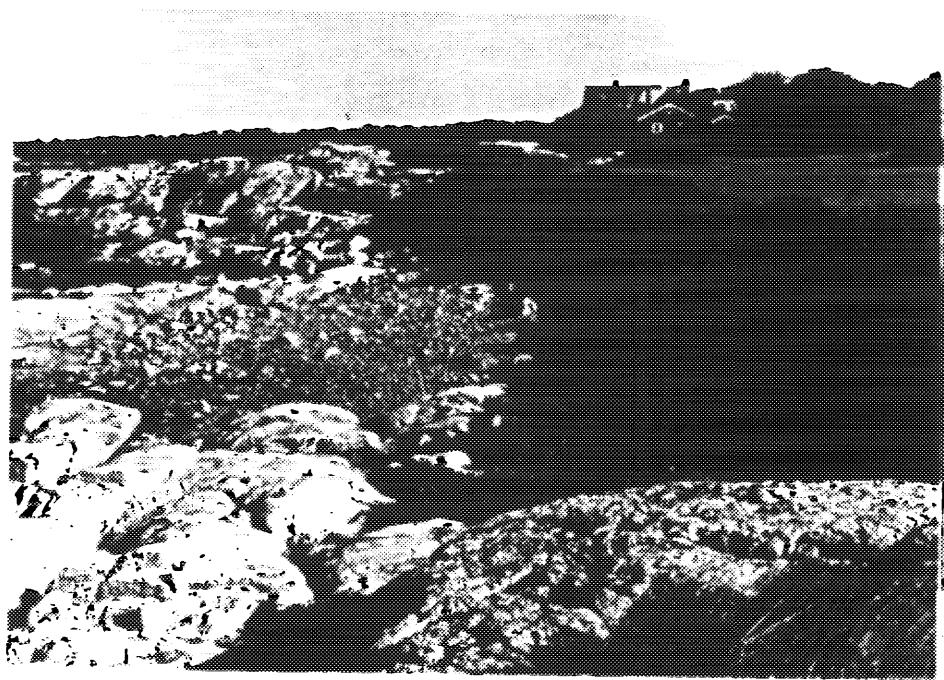
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APPENDIX C
COST AND QUANTITY ESTIMATES

APPENDIX C

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COST AND QUANTITY ESTIMATE

REACH 1 MEMORIAL BOULEVARD TO SUNDLUN PROPERTY

<u>ITEM</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
Class I, Armor Stone (3-4 ton)	110	CY	\$ 70.00	\$ 7,700
Reinforced Concrete	30	CY	500.00	15,000
Repair Existing Walk	1	JOB	L.S.	2,000
Site Preparation	1	JOB	L.S.	5,000
Miscellaneous	1	JOB	L.S.	<u>6,500</u>
Sub-total (Construction Cost)				\$36,200
Contingencies 20%				7,200
E&D and S&A 15%				<u>6,500</u>
TOTAL				\$49,900

REACH 2 VICINITY OF FIRESTONE PROPERTY TO NARRAGANSETT AVENUE

<u>ITEM</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
Class I, Armor Stone (3-4 ton)	1,375	CY	\$ 70.00	\$ 96,250
Class II Stone Slope				
Revetment (3-4 ton)	750	CY	70.00	52,500
Rockfill	5,950	CY	35.00	208,250
Reinforced Concrete	37	CY	500.00	18,500
Repair Existing Walk	1	JOB	L.S.	2,000
Site Preparation	1	JOB	L.S.	50,000
Miscellaneous	1	JOB	L.S.	<u>6,000</u>
Sub-total (Construction Cost)				\$433,500
Contingencies 20%				86,700
E&D and S&A 15%				<u>78,000</u>
TOTAL				\$598,200

REACH 3 VICINITY OF O'DONNELL PROPERTY TO OCHRE POINT

<u>ITEM</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
Class I, Armor Stone (3-4 ton)	2,260	CY	\$ 70.00	\$158,200
Class II Stone Slope				
Revetment (3-4 ton)	200	CY	70.00	14,000
Rockfill	3,340	CY	35.00	116,900
Concrete Wall	60	CY	300.00	18,000
Bituminous Walk	2,500	SF	5.00	12,500
Site Preparation	1	JOB	L. S.	50,000
Miscellaneous	1	JOB	L. S.	<u>18,000</u>
Sub-TOTAL (Construction Cost)				\$387,600
Contingencies 20%				77,520
E&D and S&A 15%				<u>58,140</u>
TOTAL				\$523,260

REACH 4 OCHRE POINT TO SHEEP POINT

<u>ITEM</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
Crushed Stone Walk	250	CY	\$ 25.00	\$ 6,250
Repair Pagoda Tunnel &				
Provide Lighting	1	JOB	L. S.	13,000
Repair Pagoda Wall	1	JOB	L. S.	45,000
Site Preparation	1	JOB	L. S.	17,250
Miscellaneous	1	JOB	L. S.	<u>17,250</u>
Sub-TOTAL (Construciton Cost)				\$ 98,750
Contingencies 20%				19,750
E&D and S&A 15%				<u>17,775</u>
TOTAL				\$136,275

REACH 5 SHEEP POINT TO ROUGH POINT

<u>ITEM</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
Class I Armor Stone (3-4 ton)	2,260	CY	\$ 70.00	\$158,200
Rockfill	2,850	CY	35.00	99,750
Reinforced Concrete	165	CY	500.00	82,500
Crushed Stone Walk	90	CY	25.00	2,250
Gravel Base Course	90	CY	15.00	1,350
Wall & Walk Section	1	JOB	L. S.	16,000
Point, Patch & Repair Existing Walk	1	JOB	L. S.	8,000
Site Preparation	1	JOB	L. S.	89,000
Miscellaneous	1	JOB	L. S.	<u>15,800</u>
Sub-TOTAL (Construction Cost)				\$472,850
Contingencies 20%				94,600
E&D and S&A 15%				<u>85.100</u>
TOTAL				\$652,550

REACH 6 ROUGH POINT TO LEDGE ROAD

<u>ITEM</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
Class I Armor Stone (3-4 ton)	140	CY	\$ 70.00	\$ 9,800
Class I Stone Slope Revetment	120	CY	70.00	8,400
Concrete with Steel Anchors	300	CY	600.00	180,000
Earth Excavation	120	CY	10.00	1,200
Gravel Base Course	260	CY	15.00	3,900
Crushed Stone Surface Course	80	CY	25.00	2,000
Point; Patch Wall	1	JOB	L. S.	15,000
Point, Patch Abutment	1	JOB	L. S.	6,000
Replace Stone Wall	1	JOB	L. S.	13,500
Topsoil & Seed	300	SY	10.00	3,000
Site Preparation	1	JOB	L. S.	80,000
Miscellaneous	1	JOB	L. S.	<u>21,000</u>
Sub-TOTAL (Construciton Cost)				\$343,800
Contingencies 20%				68,760
E&D and S&A 15%				<u>61.884</u>
TOTAL				\$474,444

REACH 7 LEDGE ROAD TO BAILEY BEACH

<u>ITEM</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
Class I Armor Stone (3-4 ton)	600	CY	\$70.00	\$42,000
Rockfill	260	CY	35.00	9,100
Gravel Base Course	90	CY	15.00	1,350
Concrete	20	CY	500.00	10,000
Crushed Stone Surface Course	40	CY	25.00	1,000
Point, Patch Wall	1	JOB	L.S.	4,000
Site Preparation	1	JOB	L.S.	18,000
Miscellaneous	1	JOB	L.S.	<u>10,950</u>
Sub-Total (Construction Cost)				\$96,300
Contingencies 20%				19,300
E&D and S&A 15%				<u>17,300</u>
TOTAL				\$133,000

MISCELLANEOUS ITEMS FROM MEMORIAL BOULEVARD TO BAILEY REACH

<u>ITEM</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
Clearing & Grubbing	1 mile	1 mile	\$24,000	\$24,000
Repair of Existing Wall	1 JOB	L.S.	1,000	1,000
Minor Repair	1 JOB	L.S.	1,250	1,250
Backfill - Breakers	1 JOB	L.S.	3,600	3,600
Site Preparation	1 JOB	L.S.	<u>15,000</u>	<u>15,000</u>
Sub-Total (Construction Cost)				\$44,850
Contingencies 20%				8,970
E&D and S&A 15%				<u>8,070</u>
TOTAL				\$61,890

SUMMARY OF 1988 COST ESTIMATE

CONSTRUCTION & DESIGN COST

<u>REACH</u>	<u>SUB-TOTAL</u>	<u>CONTINGENCIES</u>	<u>E&D</u>	<u>TOTAL</u>
1. Memorial Boulevard to Sundlun Property	\$ 36,200	\$ 7,200	\$ 6,500	\$ 49,900
2. Vicinity of Firestone Property to Narragansett Avenue	433,500	86,700	78,000	598,200
3. Vicinity of O'Donnell Property to Ochre Point	387,600	77,520	58,140	523,260
4. Ochre Point to Sheep Point	98,750	19,750	17,775	136,275
5. Sheep Point to Rough Point	472,850	94,600	85,100	652,550
6. Rough Point to Ledge Road	343,800	68,760	61,884	474,444
7. Ledge Road to Bailey Beach	96,400	19,300	17,300	133,000
8. Miscellaneous items from Memorial Boulevard to Bailey Beach	<u>44,850</u>	<u>8,970</u>	<u>8,070</u>	<u>61,890</u>
TOTAL	\$1,913,950	\$382,800	\$332,769	\$2,629,519

TOTAL ESTIMATED PROJECT COST \$2,630,000

1981 - 1988 COST COMPARISON CHART

REACH <u>(1981)</u>	REACH <u>(1988)</u>	1981 COST <u>ESTIMATE</u>	COST FOR 1981 <u>WORK COMPLETED</u>	1988 COSTS		TOTAL COST <u>FOR REMAINING PROJECT</u>
				FOR 1981 WORK <u>NOT COMPLETED</u>	FOR ADDITIONAL <u>NEW WORK</u>	
NO WORK	1	0	0	0	49,900	49,900
1	2	\$161,000	0	\$205,770	392,430	598,200
2	NO WORK	867,000	867,000	0	0	0
NO WORK	3	0	0	0	523,260	523,260
NO WORK	4	0	0	117,025*	19,250	136,275
3	5	431,000	0	652,550	0	652,550
4	6	282,000	0	474,444	0	474,444
5	7	92,000	0	133,000	0	133,000
MISC	MISC	<u>167,000</u>	<u>0</u>	<u>61,890</u>	<u>0</u>	<u>61,870</u>
TOTAL		\$2,000,000	\$867,000	\$1,644,679	\$984,840	\$2,629,519

* Previously recorded under Miscellaneous (1981)